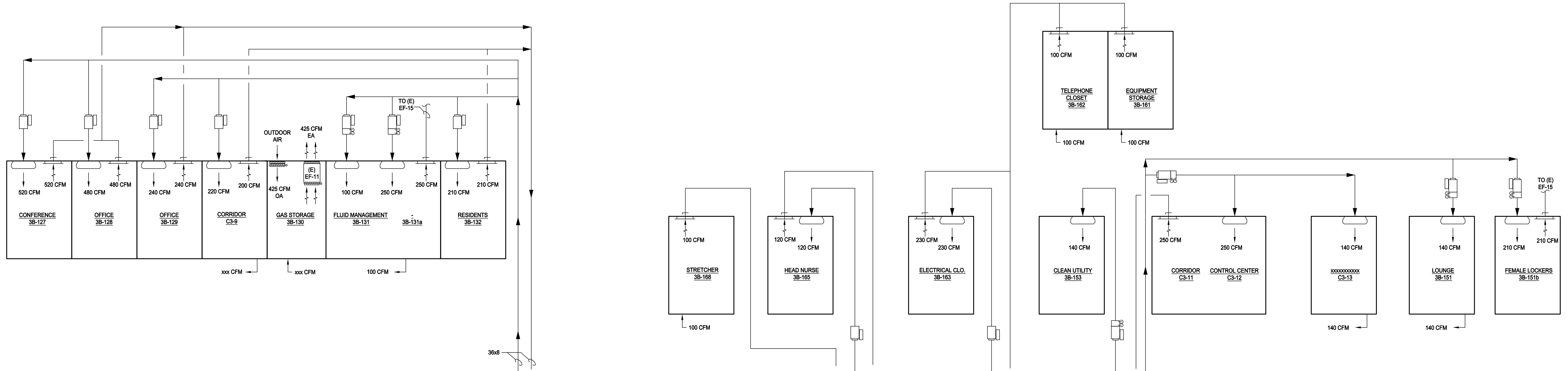


GENERAL NOTES:

- EXISTING 1S-AC-9 / 1S-RF-9 WILL BE REVISED AND REUSED TO SERVE THE NEW SURGICAL ADMIN/SUPPORT AND CIRCULATION AREAS OF THE RENOVATION. DEMOLITION WORK TO OCCUR DURING AND ACROSS PHASE 1A THRU PHASE 4A. AIRFLOW DIAGRAM REPRESENTS THE BASIC UNDERSTANDING OF EXISTING HVAC SYSTEM AIR DISTRIBUTION AND THE AS-BUILT/RECORD DESIGN DRAWING CAPACITY/AIRFLOW QUANTITIES. SINGLE LINE DIAGRAM DOES NOT INCLUDE ALL SYSTEM DETAILS AND DO NOT REPRESENT EXACT ORDER OR PLACEMENT OF TERMINAL EQUIPMENT WITHIN THE DUCTWORK SYSTEMS. REFER TO DEMOLITION PLANS FOR ADDITIONAL INFORMATION, REQUIREMENTS AND THE EXTENT OF REVISIONS TO BE MADE TO EACH SYSTEM INDICATED.
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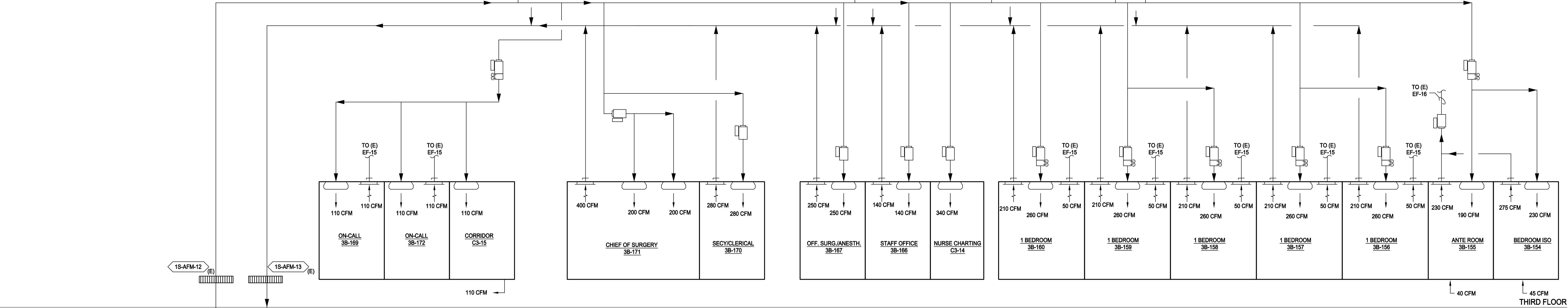
FOURTH FLOOR

FOURTH FLOOR



THIRD FLOOR

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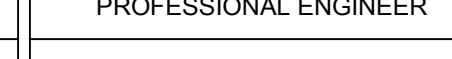

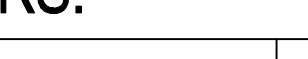
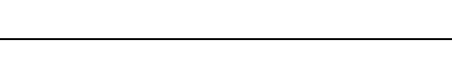



SECOND FLOOR

SECOND FLOOR



100% CONSTRUCTION DOCUMENTS
FULLY SPRINKLERED

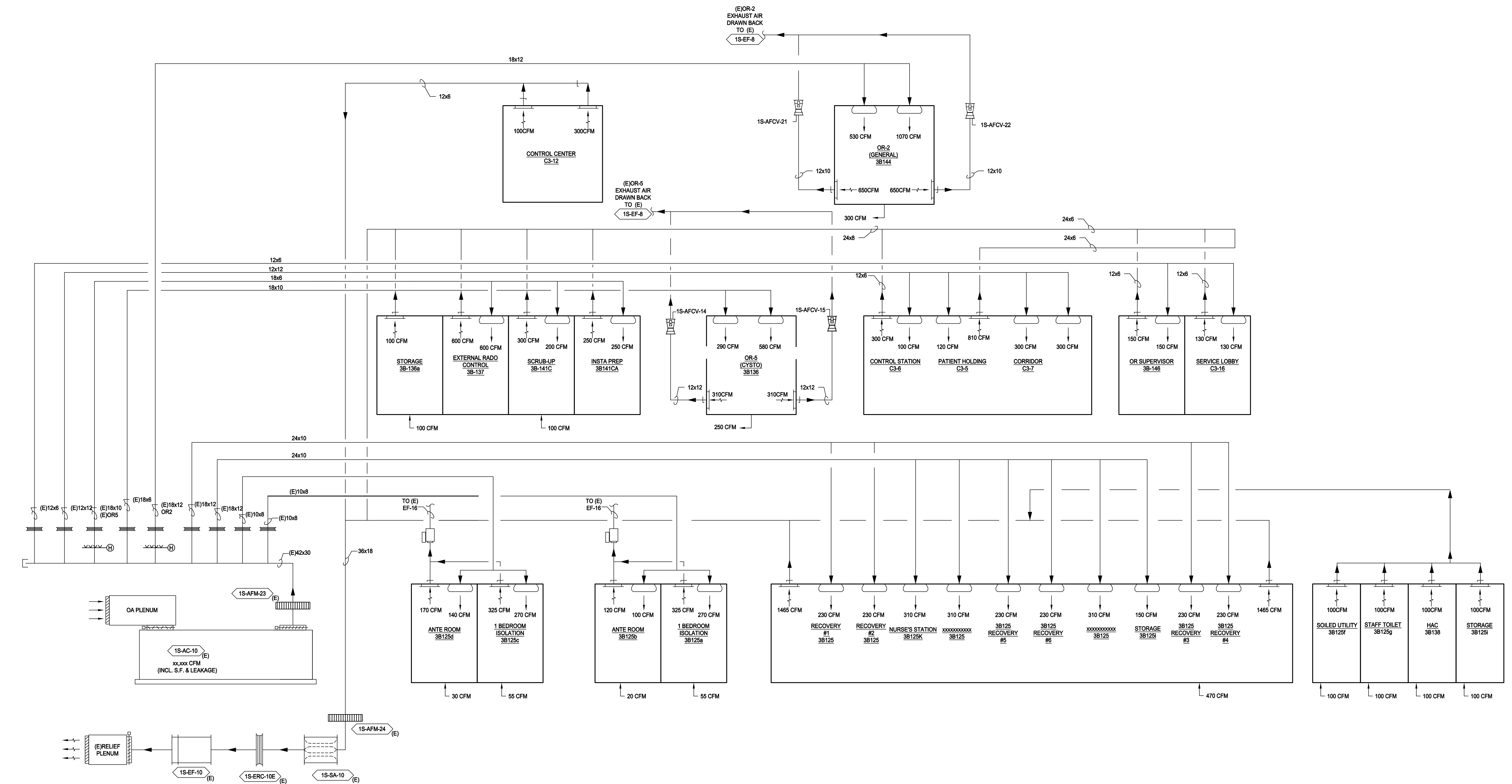
			CONSULTANTS:			MILLER-REMICK LLC PROFESSIONAL ENGINEER			ARCHITECT / ENGINEERS:			Drawing Title MECHANICAL - EXISTING AC-9 AND RF-9 AIRFLOW DIAGRAM			Project Title RENOVATE SURGICAL SERVICE & UPGRADE OPERATING ROOMS			Project Number 581-13-101			Office of Construction and Facilities Management		
									 <div>Miller-Remick LLC M.E.P. & Structural Engineering A Service Disabled Veteran Owned Small Business 1010 KINGS HIGHWAY SOUTH CHERRY HILL, NEW JERSEY 08034 PHONE: (856)429-4000 FAX: (856)429-5052</div> 			 <div>PF&A DESIGN ARCHITECTURE, PLANNING, INTERIORS World Trade Center 101 West Main Street, Suite 7000 Norfolk, VA 23510 Phone: 757-471-0537 Fax: 757-471-4208 www.pfa-architect.com</div>			Approved: Medical Center Director			Location HUNTINGTON, WV					
												Date 01-15-2016			Checked MPP			Drawn JLR			 Department of Veterans Affairs		
NO. DESCRIPTION DATE																							

GENERAL NOTES:

- EXISTING 1S-AC-10 / 1S-EF-10 WILL BE REVISED AND REUSED TO SERVE THE NEW SURGICAL PREPARATION/ PRE-OP/ISOLATION AREAS OF THE RENOVATION. DEMOLITION WORK TO OCCUR DURING PHASE 4A. AIRFLOW DIAGRAM REPRESENTS THE BASIC UNDERSTANDING OF EXISTING HVAC SYSTEM AIR DISTRIBUTION AND THE AS-BUILT RECORD DESIGN CAPACITY. AIRFLOW QUANTITIES: SINGLE LINE DIAGRAMS DO NOT INCLUDE ALL SYSTEM DETAILS AND DO NOT REPRESENT EXACT ORDER OR PLACEMENT OF TERMINAL EQUIPMENT WITHIN THE DUCTWORK SYSTEMS. REFER TO DEMOLITION PLANS FOR ADDITIONAL INFORMATION, REQUIREMENTS AND THE EXTENT OF REVISIONS TO BE MADE TO EACH SYSTEM INDICATED.
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FOURTH FLOOR

FOURTH FLOOR



THIRD FLOOR

THIRD FLOOR

100% CONSTRUCTION DOCUMENTS
FULLY SPRINKLERED

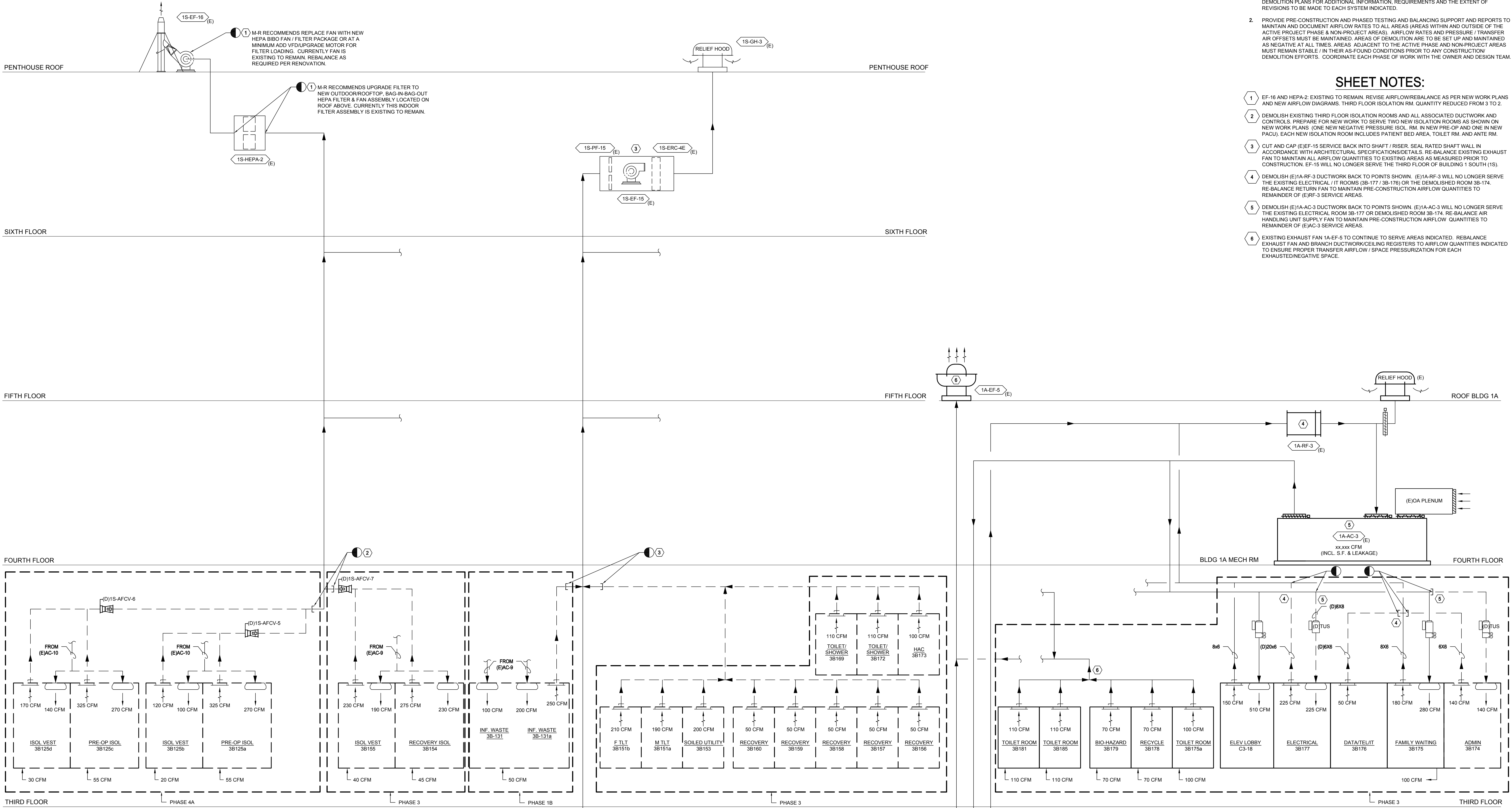
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GENERAL NOTES:

- SOME EXISTING EQUIPMENT WILL BE REVISED/REUSED TO SERVE SPECIFIC AREAS OF THE RENOVATION. DEMOLITION WORK TO OCCUR DURING AND ACROSS PHASES 1B THROUGH 4A AS SHOWN. AIRFLOW DIAGRAM REPRESENTS THE BASIC UNDERSTANDING OF EXISTING HVAC SYSTEM AIR DISTRIBUTION AND THE AS-BUILT/RECORD DESIGN DRAWING CAPACITY/AIRFLOW QUANTITIES. SINGLE LINE DIAGRAM DOES NOT INCLUDE ALL SYSTEM DETAILS AND DOES NOT REPRESENT EXACT ORDER OR PLACEMENT OF TERMINAL EQUIPMENT WITHIN THE DUCTWORK SYSTEMS. REFER TO DEMOLITION PLANS FOR ADDITIONAL INFORMATION, REQUIREMENTS AND THE EXTENT OF REVISIONS TO BE MADE TO EACH SYSTEM INDICATED.
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SHEET NOTES:

- EF-16 AND HEPA-2: EXISTING TO REMAIN. REVISE AIRFLOW/REBALANCE AS PER NEW WORK PLANS AND NEW AIRFLOW DIAGRAMS. THIRD FLOOR ISOLATION RM. QUANTITY REDUCED FROM 3 TO 2.
- DEMOLISH EXISTING THIRD FLOOR ISOLATION ROOMS AND ALL ASSOCIATED DUCTWORK AND CONTROLS. PREPARE FOR NEW WORK TO SERVE TWO NEW ISOLATION ROOMS AS SHOWN ON NEW WORK PLANS (ONE NEW NEGATIVE PRESSURE ISOL. RM. IN NEW PRE-OP AND ONE IN NEW PACU). EACH NEW ISOLATION ROOM INCLUDES PATIENT BED AREA, TOILET RM. AND ANTE RM.
- CUT AND CAP (E)EF-15 SERVICE BACK INTO SHAFT / RISER. SEAL RATED SHAFT WALL IN ACCORDANCE WITH ARCHITECTURAL SPECIFICATIONS/DETAILS. RE-BALANCE EXISTING EXHAUST FAN TO MAINTAIN ALL AIRFLOW QUANTITIES TO EXISTING AREAS AS MEASURED PRIOR TO CONSTRUCTION. EF-15 WILL NO LONGER SERVE THE THIRD FLOOR OF BUILDING 1 SOUTH (1S).
- DEMOLISH (E)1A-RF-3 DUCTWORK BACK TO POINTS SHOWN. (E)1A-RF-3 WILL NO LONGER SERVE THE EXISTING ELECTRICAL / IT ROOMS (3B-177 / 3B-178) OR THE DEMOLISHED ROOM 3B-174. RE-BALANCE RETURN FAN TO MAINTAIN PRE-CONSTRUCTION AIRFLOW QUANTITIES TO REMAINDER OF (E)RF-3 SERVICE AREAS.
- DEMOLISH (E)1A-AC-3 DUCTWORK BACK TO POINTS SHOWN. (E)1A-AC-3 WILL NO LONGER SERVE THE EXISTING ELECTRICAL ROOM 3B-177 OR DEMOLISHED ROOM 3B-174. RE-BALANCE AIR HANDLING UNIT SUPPLY FAN TO MAINTAIN PRE-CONSTRUCTION AIRFLOW QUANTITIES TO REMAINDER OF (E)AC-3 SERVICE AREAS.
- EXISTING EXHAUST FAN 1A-EF-5 TO CONTINUE TO SERVE AREAS INDICATED. RE-BALANCE EXHAUST FAN AND BRANCH DUCTWORK/CEILING REGISTERS TO AIRFLOW QUANTITIES INDICATED TO ENSURE PROPER TRANSFER AIRFLOW / SPACE PRESSURIZATION FOR EACH EXHAUSTED/NEGATIVE SPACE.



ISOLATION ROOM EXHAUST

GENERAL / TOILET EXHAUST

BLDG 1A HVAC

100% CONSTRUCTION DOCUMENTS
FULLY SPRINKLERED

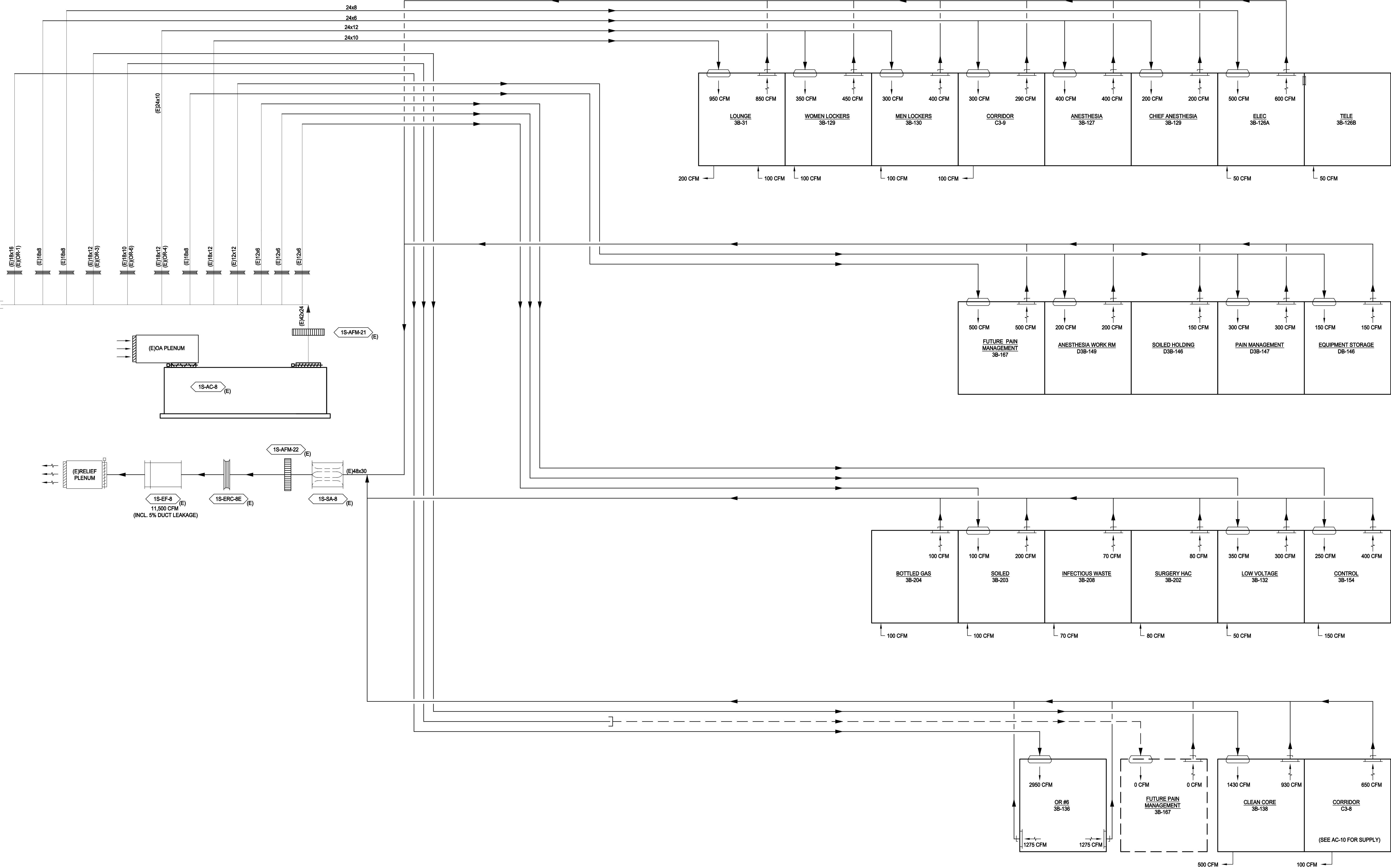
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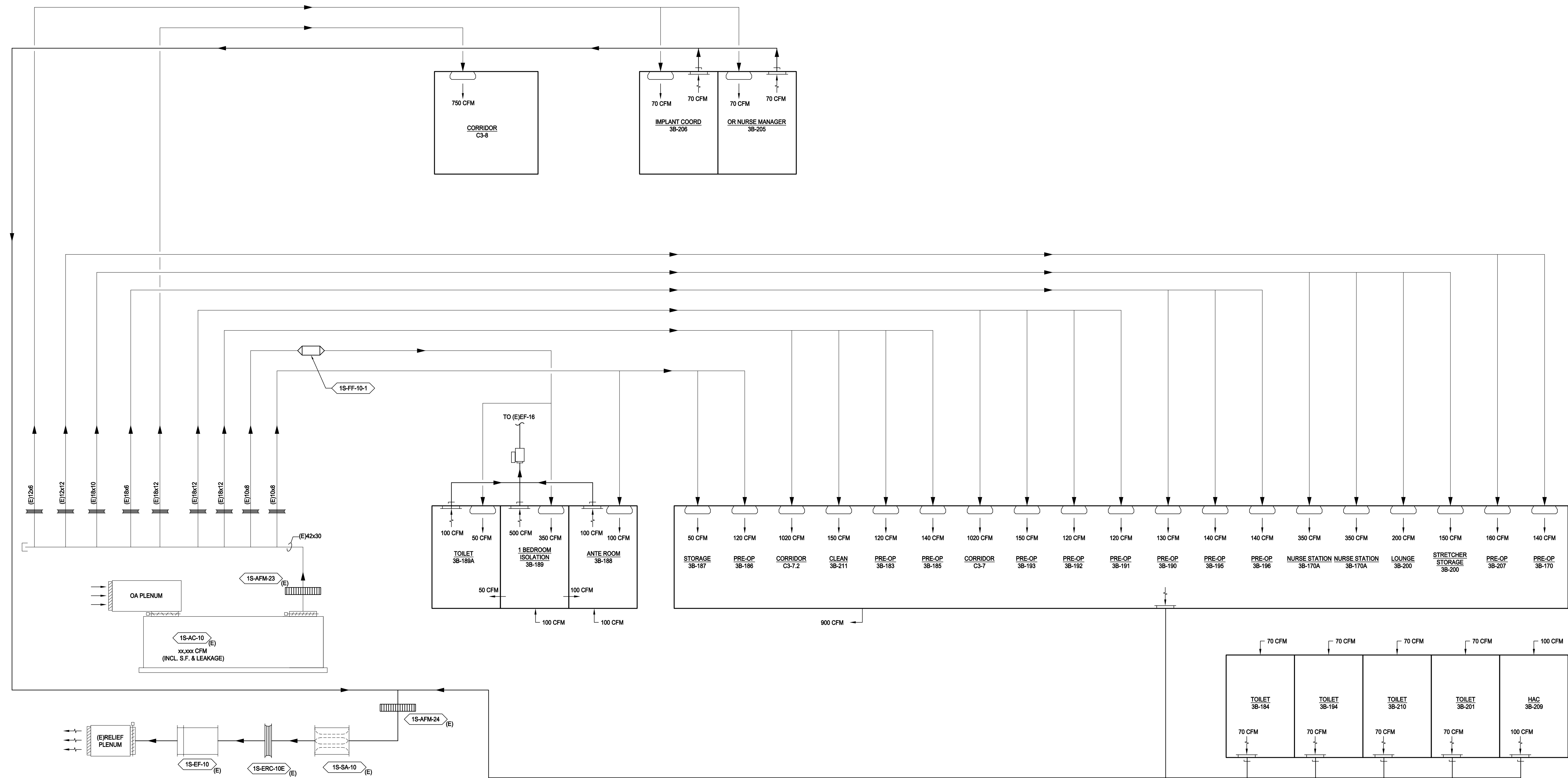
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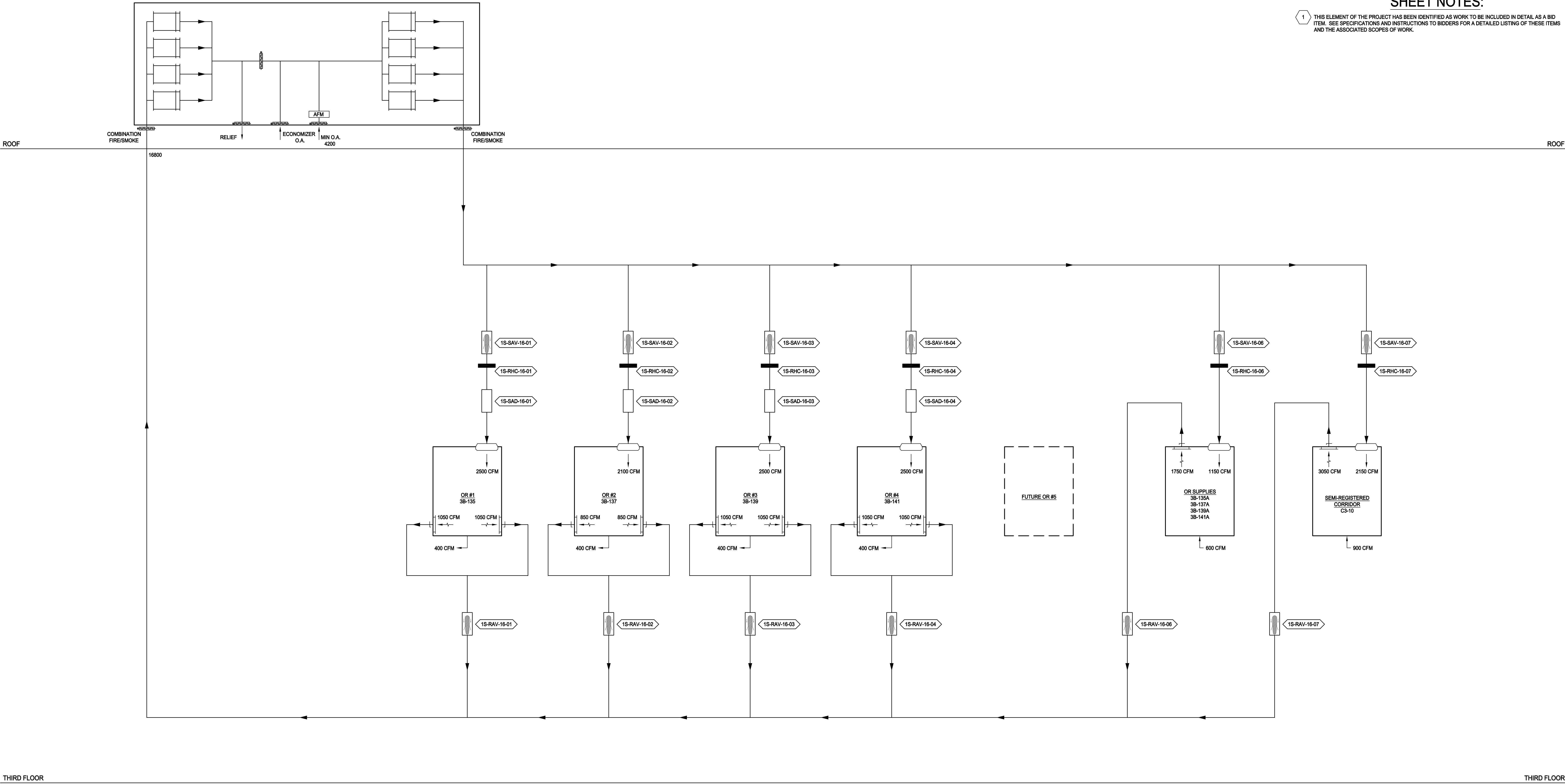
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GENERAL NOTES:

- AC-16 WILL SERVE NEW SURGICAL SUITE/STERILE AREAS OF THE RENOVATION. NEW WORK TO OCCUR DURING AND ACROSS PHASES 2 THRU 4A AS SHOWN. AIRFLOW DIAGRAM REPRESENTS THE BASIC INTENT FOR HVAC SYSTEM AIR DISTRIBUTION AND THE REQUIRED CAPACITY/AIRFLOW QUANTITIES. SINGLE LINE DIAGRAMS DO NOT INCLUDE ALL SYSTEM DETAILS AND DO NOT REPRESENT EXACT ORDER OR PLACEMENT OF TERMINAL EQUIPMENT WITHIN THE DUCTWORK SYSTEMS. REFER TO NEW WORK PLANS, DETAILS AND CONTROLS DIAGRAMS FOR ADDITIONAL INFORMATION, REQUIREMENTS AND THE EXTENT OF NEW AC-16/RF-16 SERVICE.
- PROVIDE PRE-CONSTRUCTION AND PHASED TESTING AND BALANCING SUPPORT AND REPORTS TO MAINTAIN AND DOCUMENT AIRFLOW RATES TO ALL PROJECT AREAS. AIRFLOW RATES AND PRESSURE / TRANSFER AIR OFFSETS MUST BE MAINTAINED. REFER ALSO TO DRAWING M7.00 AND THE ASSOCIATED PEM COMPONENT AND AIRFLOW CONTROL VALVE EQUIPMENT SCHEDULES FOR ADDITIONAL INFORMATION. COORDINATE EACH PHASE OF WORK WITH THE OWNER AND DESIGN TEAM.
- SCHEDULED AHU CAPACITY INCLUDES DUCT LEAKAGE ALLOWANCE AND SAFETY AND IS NOT SUM OF TERMINAL CFM.

SHEET NOTES:

- 1 THIS ELEMENT OF THE PROJECT HAS BEEN IDENTIFIED AS WORK TO BE INCLUDED IN DETAIL AS A BID ITEM. SEE SPECIFICATIONS AND INSTRUCTIONS TO BIDDERS FOR A DETAILED LISTING OF THESE ITEMS AND THE ASSOCIATED SCOPES OF WORK.



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CONSULTANTS:			MILLER-REMICK LLC PROFESSIONAL ENGINEER			ARCHITECT / ENGINEERS:			Drawing Title MECHANICAL PROPOSED NEW SURGERY 1S-AHU-16 AIRFLOW DIAGRAM			Project Title RENOVATE SURGICAL SERVICE & UPGRADE OPERATING ROOMS			Project Number 581-13-101			Office of Construction and Facilities Management Department of Veterans Affairs					
									Approved: Medical Center Director			Location HUNTINGTON, WV			Building Number 1S								
NO. DESCRIPTION DATE												Date 01-15-2016			Checked MPP						Drawn JLR		
																		Drawing Number M7.07					

A

B

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CONTROL POINT DESCRIPTOR LEGEND

	ATC CONTRACTOR PROVIDE DDC POINT AND HARDWARE		FILTER DIFFERENTIAL PRESSURE SWITCH		OUTSIDE AIR WET BULB TEMPERATURE SENSOR
	CONTROL DEVICE PROVIDED BY ELECTRICAL OR PLUMBING CONTRACTOR BUT INTERFACED TO DDC SYSTEM BY ATC CONTRACTOR		FAN ISOLATION DAMPER (NON UL LISTED)		PRIMARY CHILLED WATER RETURN TEMPERATURE SENSOR
	ATC CONTRACTOR INTERFACE TO EQUIPMENT MANUFACTURER'S HARDWARE		FLOW METER/TRANSMITTER		PRIMARY CHILLED WATER SUPPLY TEMPERATURE SENSOR
	AUTOMATIC CONTROL VALVE		FREEZESTAT		PREHEAT CONTROL VALVE
	AIR HANDLING UNIT DISCHARGE AIR TEMPERATURE SENSOR		HUMIDITY SENSOR		RETURN AIR DAMPER
	AIR HANDLING UNIT HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR		HOOD ALARM		RETURN AIR TEMPERATURE SENSOR
	AIR HANDLING UNIT HEAT RECOVERY COIL VALVE		HOOD SASH SWITCH		REHEAT CONTROL VALVE
	ALARM		HIGH HUMIDITY LIMIT SENSOR		RUN INDICATION
	AIR VOLUME STATION		HUMIDIFIER ISOLATION VALVE		RETURN ISOLATION DAMPER
	BASEBOARD CONTROL VALVE		HIGH/LOW SETTING		ROOM TEMPERATURE SENSOR
	BYPASS VALVE		HIGH/LOW HUMIDITY LIMIT SENSOR		ROOM OCCUPANCY SENSOR
	COOLING COIL LEAVING AIR TEMPERATURE SENSOR		HEAT RECOVERY COIL ENTERING AIR TEMPERATURE SENSOR		SECONDARY CHILLED WATER RETURN TEMPERATURE SENSOR
	CHARCOAL FILTER DIFFERENTIAL PRESSURE		HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR		SECONDARY CHILLED WATER SUPPLY TEMPERATURE SENSOR
	SWITCH CHILLED WATER COIL LEAVING AIR TEMPERATURE SENSOR		HEAT RECOVERY COIL TEMPERATURE SENSOR		SUPPLY AIR DAMPER
	CHILLED WATER RETURN TEMPERATURE SENSOR		HEAT RECOVERY COIL VALVE		START/STOP
	CHILLED WATER SUPPLY TEMPERATURE SENSOR		HEAT RECOVERY LOOP 3-WAY VALVE		STEAM COIL LEAVING AIR TEMPERATURE SENSOR
	CURRENT TRANSFORMER RELAY		HAND SWITCH		STEAM COIL VALVE
	CHILLED WATER VALVE		HIGH STATIC PRESSURE SWITCH		SMOKE DETECTOR
	DISCHARGE AIR TEMPERATURE SENSOR		HUMIDITY VALVE		STATIC PRESSURE SENSOR
	DISCHARGE AIR TEMPERATURE LIMITER		HOT WATER RETURN TEMPERATURE SENSOR		SUPPLY SMOKE ISOLATION DAMPER (UL LISTED)
	DIFFERENTIAL PRESSURE SENSOR		HOT WATER SUPPLY TEMPERATURE SENSOR		SUCTION STATIC PRESSURE SENSOR
	DIFFERENTIAL PRESSURE SWITCH		HOT WATER VALVE		START-STOP
	ROOM DIFFERENTIAL PRESSURE MONITOR		INTAKE AIR TEMPERATURE SENSOR		TEMPERATURE SENSOR
	DISCHARGE STATIC PRESSURE SENSOR		INTEGRAL FACE AND BYPASS DAMPER		TEMPERATURE CONTROL VALVE
	EXHAUST AIR VALVE		CURRENT TRANSDUCER		VARIABLE FREQUENCY DRIVE SPEED CONTROL
	ENVIRONMENTAL CONTROL CENTER (BAS)		ISOLATION VALVE		VARIABLE FREQUENCY DRIVE SPEED OUTPUT
	EXHAUST HEAT RECOVERY COIL ENTERING AIR TEMPERATURE SENSOR		LEAVING AIR TEMPERATURE SENSOR		VIBRATION SWITCH
	EXHAUST HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR		LIGHT SWITCH INTERFACE		WATER FLOW SWITCH
	EXHAUST HEAT RECOVERY COIL VALVE		LOW STATIC PRESSURE SWITCH		WALL SWITCH
	END SWITCH		MAKEUP WATER VALVE		UNOCCUPIED MODE OVERRIDE PUSH BUTTON
	EXHAUST STATIC PRESSURE SENSOR		OUTSIDE AIR DAMPER		MULTI-TECHNOLOGY ROOM OCCUPANCY SENSOR
	ELECTRIC UNIT HEATER		OUTSIDE AIR DRY BULB TEMPERATURE SENSOR		
	FAULT ALARM		OUTSIDE AIR TEMPERATURE SENSOR		

CONTROL ABBREVIATIONS

ACD ACV AHU AHUDAT AHUHRCLAT AHUHRV ALM ATC AVS AS BAS BCV BIBO BMS BV CCLAT CFDPS CHWCLAT CHWRT CHWST CHWV DAT DATL DDC DDCFP DP DPS DPV DSP DWI EAD ECC EHRCEAT EHRCLAT EHRV ES ESP ET	AUTOMATIC CONTROL DAMPER AUTOMATIC CONTROL VALVE AIR HANDLING UNIT AIR HANDLING UNIT DISCHARGE AIR TEMPERATURE SENSOR AIR HANDLING UNIT HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR AIR HANDLING UNIT HEAT RECOVERY COIL VALVE ALARM AUTOMATIC TEMPERATURE CONTROL AIR VOLUME STATION AIR SEPARATOR BUILDING AUTOMATION SYSTEM BASEBOARD CONTROL VALVE BAG-IN BAG-OUT BUILDING MANAGEMENT SYSTEM (SYNONYMOUS WITH BAS) BYPASS VALVE COOLING COIL LEAVING AIR TEMPERATURE SENSOR CHARCOAL FILTER DIFFERENTIAL PRESSURE SWITCH CHILLED WATER COIL LEAVING AIR TEMPERATURE SENSOR CHILLED WATER RETURN TEMPERATURE SENSOR CHILLED WATER SUPPLY TEMPERATURE SENSOR CHILLED WATER VALVE DISCHARGE AIR TEMPERATURE SENSOR DISCHARGE AIR TEMPERATURE LIMITER DIRECT DIGITAL CONTROL DIRECT DIGITAL CONTROL FIELD PANEL DIFFERENTIAL PRESSURE SENSOR DIFFERENTIAL PRESSURE SWITCH DIFFERENTIAL PRESSURE BYPASS VALVE DISCHARGE STATIC PRESSURE SENSOR DOUBLE WIDTH DOUBLE INLET EXHAUST AIR DAMPER ENVIRONMENTAL CONTROL CENTER (BAS) EXHAUST HEAT RECOVERY COIL ENTERING AIR TEMPERATURE SENSOR EXHAUST HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR EXHAUST HEAT RECOVERY COIL VALVE END SWITCH EXHAUST STATIC PRESSURE SENSOR EXPANSION TANK	FA FDPS FID FMT FZ GAPC GFP H HALM HHL HIV HLH HOA HRCEAT HRCLAT HRLT HRCV HRGP HRL3WV HS HSPS HSS HV HWST HWRT HWV IFBD IGT LAT LSPS LS NC NO MUWV	FAULT ALARM FILTER DIFFERENTIAL PRESSURE SWITCH FAN ISOLATION DAMPER FLOW METER/TRANSMITTER FREEZESTAT GENESIS AIR PHOTOCATALYSIS COMPOUND (COMMERCIAL GRADE) GLYCOL FILL PUMP HUMIDITY SENSOR HOOD ALARM HIGH HUMIDITY LIMIT SENSOR HUMIDIFIER ISOLATION VALVE HIGH/LOW HUMIDITY LIMIT SENSOR HAND-OFF-AUTOMATIC SWITCH HEAT RECOVERY COIL ENTERING AIR TEMPERATURE SENSOR HEAT RECOVERY COIL LEAVING AIR TEMPERATURE SENSOR HEAT RECOVERY LOOP TEMPERATURE SENSOR HEAT RECOVERY COIL VALVE HEAT RECOVERY GLYCOL PUMP HEAT RECOVERY LOOP 3-WAY VALVE HAND SWITCH HIGH STATIC PRESSURE SWITCH HOOD SASH SWITCH HUMIDITY VALVE HOT WATER SUPPLY TEMPERATURE SENSOR HOT WATER RETURN TEMPERATURE SENSOR HOT WATER VALVE INTEGRAL FACE & BYPASS DAMPER INLET GUIDE VANES LEAVING AIR TEMPERATURE SENSOR LOW STATIC PRESSURE SWITCH LIGHT SWITCH INTERFACE NORMALLY CLOSED NORMALLY OPEN MAKEUP WATER VALVE	OAD OADBT OAWBT OAT PCHWRT PCWST PCP RAD RAT RCV RH RI RID RT SAV SCHWST SCHWRT SCLAT SCV SD SDET SP S/S SSID SSP TCV VFDS VFDSO VS WC WFS WS	OUTSIDE AIR DAMPER OUTSIDE AIR DRY BULB TEMPERATURE SENSOR OUTSIDE AIR WET BULB TEMPERATURE SENSOR OUTSIDE AIR TEMPERATURE SENSOR PRIMARY CHILLED WATER RETURN TEMPERATURE SENSOR PRIMARY CHILLED WATER SUPPLY TEMPERATURE SENSOR POPULATED CATALYST PANEL (GAPC - PCP COMPOUND) RETURN AIR DAMPER RETURN AIR TEMPERATURE SENSOR REHEAT CONTROL VALVE RELATIVE HUMIDITY RUN INDICATOR RETURN ISOLATION DAMPER ROOM TEMPERATURE SENSOR SUPPLY AIR DAMPER SECONDARY CHILLED WATER SUPPLY TEMPERATURE SENSOR SECONDARY CHILLED WATER RETURN TEMPERATURE SENSOR STEAM COIL LEAVING AIR TEMPERATURE SENSOR STEAM COIL VALVE SMOKE DAMPER SMOKE DETECTOR STATIC PRESSURE SENSOR START/STOP SUPPLY SMOKE ISOLATION DAMPER SUCTION STATIC PRESSURE SENSOR TEMPERATURE SENSOR TEMPERATURE CONTROL VALVE VARIABLE FREQUENCY DRIVE SPEED VARIABLE FREQUENCY DRIVE SPEED OUTPUT VIBRATION SWITCH WATER COLUMN WATER FLOW SWITCH WALL SWITCH
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CONTROLS GENERAL NOTES

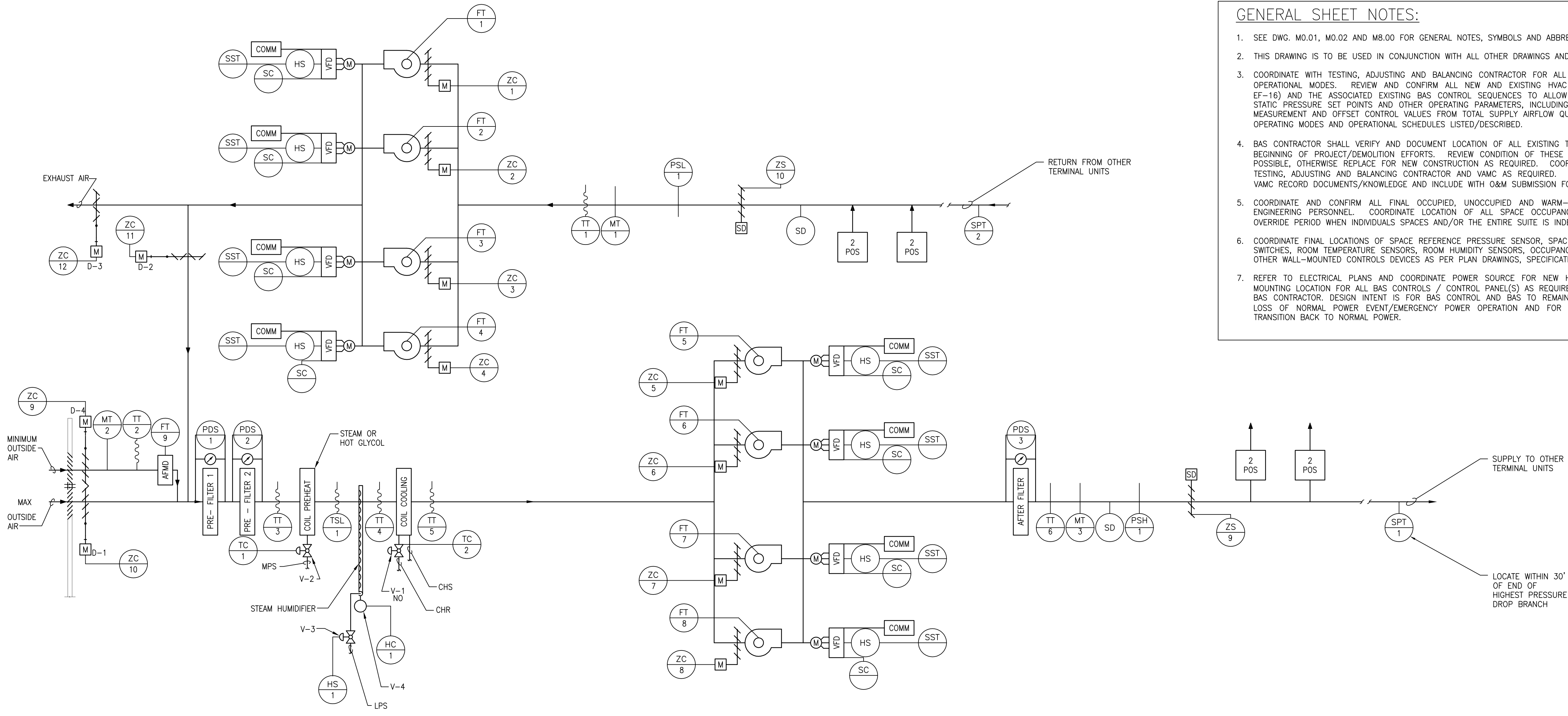
- THE SEQUENCES OF OPERATIONS OUTLINED SHALL BE PERFORMED BY NEW DIRECT DIGITAL CONTROL, STAND ALONE FIELD PANELS, (DDCFP) COMPATIBLE WITH THE EXISTING BUILDING MANAGEMENT SYSTEM (BMS). NAMES FOR ALL POINTS AND VARIABLES SHALL BE COORDINATED WITH THE VAMC PRIOR TO SHOP DRAWINGS AND PROGRAMMING.
- THE SEQUENCES OF OPERATIONS OUTLINED SHALL BE PERFORMED IN A STAGGERED/STAGED MANNER DURING INITIAL START-UP AND DURING THE TRANSITION FROM NORMAL TO EMERGENCY POWER OPERATION TO PREVENT OVERLOADING OF THE BUILDING/SITE ELECTRICAL POWER SYSTEMS. DESIGN INTENT IS FOR MECHANICAL EQUIPMENT TO OPERATE CONTINUOUSLY AND TO BE INDEXED/STARTED IN ORDER OF PRIORITY BEGINNING WITH BUILDING CENTRAL HYDRONIC SYSTEMS (REHEAT/HEATING HOT WATER HEAT EXCHANGERS, PUMPS AND CHILLED WATER CHILLERS, PUMPS, ETC.), CENTRAL STATION AIR HANDLING EQUIPMENT (INTERLOCKED SUPPLY, RETURN AND EXHAUST EQUIPMENT), AND ROOM/OCCUPIED SPACE AIR AND HYDRONIC TERMINAL EQUIPMENT. REFER TO CONTROLS DIAGRAMS FOR EACH SPECIFIC SYSTEM/COMPONENT FOR ADDITIONAL INFORMATION, SAFETIES, ETC. SUBMIT THE START/RESTART SEQUENCE WITHIN THE SPECIFIED BAS CONTROLS SUBMITTAL FOR REVIEW BY OWNER AND DESIGN ENGINEERS.
- EQUIPMENT SHALL BE CAPABLE OF MANUAL OPERATION THROUGH HOA SWITCHES IN STARTERS. THE POSITIONS OF ALL CONTROL VALVES CONTROLLED BY THE BMS SHALL BE CAPABLE OF MANUAL POSITIONING VIA THE CONTROL CENTER TERMINAL OR BY LAPTOP COMPUTER PLUGGED IN TO THE DIRECT DIGITAL CONTROL FIELD CONTROL PANEL.
- ALL VALVE AND DAMPER ACTUATORS SHALL BE ELECTRIC/ELECTRONIC.
- REFER TO MECHANICAL DIAGRAMS AND PLANS FOR SENSOR LOCATIONS. COORDINATE TO INSURE PROPER UPSTREAM AND DOWNSTREAM DIAMETERS FOR EACH SENSOR.
- PROVIDE CURRENT SENSOR ACROSS EACH FAN OR PUMP (WITH THE EXCEPTION OF VFD'S) TO PROVE STATUS AT BMS. SENSORS SHALL BE CAPABLE OF DIFFERENTIATING BETWEEN NORMAL OPERATION AND FREE WHEELING (I.E. FAN BELT BREAKAGE).
- BMS CONTROLLERS AND ALL OTHER CONTROL DEVICES AND SENSORS THAT REQUIRE POWER SHALL BE POWERED FROM EMERGENCY POWER PANEL.
- WHEN SYSTEMS ARE OFF, ALL VALVES AND DAMPERS SHALL GO TO THEIR FAIL-SAFE POSITIONS. FAIL-SAFE POSITIONS ARE POSITIONS THAT DEVICES WILL GO TO WHEN DE-ENERGIZED: NO = NORMALLY OPEN, NC = NORMALLY CLOSED.
- ALL SETPOINTS AND TIME DELAYS MENTIONED AS PART OF THIS SYSTEM SHALL BE ADJUSTABLE AT THE BMS FRONT END BY AN OPERATOR WITHOUT ANY HARDWARE OR SOFTWARE REVISIONS.
- ALL DAMPERS SHALL HAVE END SWITCHES (ES). EACH END SWITCH SHALL PROVE DAMPER OPEN AND CLOSED. WHEN COMMANDED TO OPEN OR CLOSE, AFTER 30 SECONDS (ADJ.), THE END SWITCH DOES NOT SWITCH, THE CONTROL SYSTEM SHALL SEND AN ALARM TO THE BMS FRONT END.

100% CONSTRUCTION DOCUMENTS
FULLY SPRINKLERED

<div>CONSULTANTS:</div>			<div>MILLER-REMICK LLC PROFESSIONAL ENGINEER</div>		<div>ARCHITECT / ENGINEERS:</div>		<div>Drawing Title MECHANICAL CONTROLS NOTES AND LEGENDS</div>		<div>Project Title RENOVATE SURGICAL SERVICE & UPGRADE OPERATING ROOMS</div>		<div>Project Number 581-13-101</div>		<div>Office of Construction and Facilities Management</div>	
							<div>Approved: Medical Center Director</div>		<div>Location HUNTINGTON, WV</div>		<div>Building Number 1S</div>			
									<div>Date 01-15-2016</div>		<div>Checked MPP</div>			
											<div>Drawing Number M8.00</div>			
<div>NO. DESCRIPTION DATE</div>					<div>PF&A M.E.P. & Structural Engineering A Service Disabled Veteran Owned Small Business 1010 KINGS HIGHWAY SOUTH CHERRY HILL, NEW JERSEY 08034 PHONE: (856)420-4000 FAX: (856)420-5002</div>		<div>PF&A ARCHITECTURE, PLANNING, INTERIORS West Trade Center 101 West Main Street, Suite 7000 Norfolk, VA 23510 Phone: 757-471-6837 Fax: 757-471-6026 www.pfa-architect.com</div>							

CONTROLS SYMBOLS

T	ROOM THERMOSTAT/TRANSMITTER - WALL MOUNT
TT	TEMPERATURE TRANSMITTER
TT	TEMPERATURE TRANSMITTER, AVERAGING ELEMENT
MT	MOISTURE (HUMIDITY) TRANSMITTER
PT	PRESSURE TRANSMITTER
SPS	STATIC PRESSURE SENSOR
FT	FLOW TRANSMITTER
IT	CURRENT TRANSMITTER
SD	SMOKE DETECTOR
PDT	PRESSURE DIFFERENTIAL TRANSMITTER
PDS	PRESSURE DIFFERENTIAL SWITCH
HS	HAND SWITCH (HAND-OFF-AUTO SWITCH)
ZC	VALVE OR DAMPER POSITION CONTROLLER
TSL	TEMPERATURE SWITCH, LOW (FREEZE/STAT)
PSH	PRESSURE SWITCH HIGH
PSL	PRESSURE SWITCH LOW
DCC	OCCUPANCY SENSOR
VFD	VARIABLE SPEED MOTOR CONTROLLER
TC	TEMPERATURE CONTROLLER. SEE SEQUENCE OF OPERATION
PC	PRESSURE CONTROLLER. SEE SEQUENCE OF OPERATION
SC	SPEED CONTROLLER. SEE SEQUENCE OF OPERATION
⊗	MOTOR STARTER
M	ELECTRIC OPERATED CONTROL DAMPER/OR VALVE
DPSE	ROOM DIFFERENTIAL PRESSURE MONITOR



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- COORDINATE WITH TESTING, ADJUSTING AND BALANCING CONTRACTOR FOR ALL OCCUPIED, UNOCCUPIED, SMOKE PURGE AND WARM-UP OPERATIONAL MODES. REVIEW AND CONFIRM ALL NEW AND EXISTING HVAC EQUIPMENT, (AC-8/EF-8, AC-9/RF-9, AC-10/EF-10, EF-16) AND THE ASSOCIATED EXISTING BAS CONTROL SEQUENCES TO ALLOW FOR EACH MODE DESCRIBED HEREIN. REVISE SYSTEM STATIC PRESSURE SET POINTS AND OTHER OPERATING PARAMETERS, INCLUDING OUTDOOR AIR, SUPPLY, RETURN AND EXHAUST AIRFLOW MEASUREMENT AND OFFSET CONTROL VALUES FROM TOTAL SUPPLY AIRFLOW QUANTITIES FOR ALL MODES AS REQUIRED TO ACHIEVE THE OPERATING MODES AND OPERATIONAL SCHEDULES LISTED/DESCRIBED.
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- COORDINATE AND CONFIRM ALL FINAL OCCUPIED, UNOCCUPIED AND WARM-UP PERIODS AND OCCUPANCY SCHEDULES WITH VAMC ENGINEERING PERSONNEL. COORDINATE LOCATION OF ALL SPACE OCCUPANCY SENSORS AND THE DURATION OF THE UNOCCUPIED OVERRIDE PERIOD WHEN INDIVIDUALS SPACES AND/OR THE ENTIRE SUITE IS INDEXED INTO NORMAL OCCUPIED MODE TEMPORARILY.
- COORDINATE FINAL LOCATIONS OF SPACE REFERENCE PRESSURE SENSOR, SPACE PRESSURIZATION MONITORING PANELS, KEYED-OVERRIDE SWITCHES, ROOM TEMPERATURE SENSORS, ROOM HUMIDITY SENSORS, OCCUPANCY SENSORS, UNOCCUPIED OVERRIDE PUSH BUTTONS AND OTHER WALL-MOUNTED CONTROLS DEVICES AS PER PLAN DRAWINGS, SPECIFICATIONS AND VAMC SITE ENGINEERING PERSONNEL REVIEW.
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1 MECHANICAL AHU FOR SURGICAL SUITE (VAV) DIAGRAM

SCALE:

1S-AHU-16 SEQUENCE OF OPERATIONS

1 GENERAL:

- DESCRIPTION: UNIT IS VAV AIR UNIT WITH TWO PARALLEL OPERATION SUPPLY FANS, TWO PARALLEL OPERATION RETURN FANS, MINIMUM OUTSIDE AIR PRECONDITIONING HEAT RECOVERY WHEEL, ECONOMIZER CYCLE AND MAXIMUM ECONOMIZER DAMPERS, STEAM PREHEAT COIL, CHILLED WATER COOLING COIL AND STEAM HUMIDIFIER.
- A 24 HOUR PER DAY, 365 DAY OCCUPIED/UNOCCUPIED OPERATING SCHEDULE, WITH HOLIDAYS, WILL BE DEFINED FOR UNIT.
- UNIT IS TO BE STARTED AND STOPPED THROUGH AN H-O-A SELECTOR SWITCH LOCATED AT THE UNIT. IN THE AUTOMATIC POSITION, THE OCCUPIED/UNOCCUPIED SCHEDULE SHALL INDEX THE UNIT TO RUN IN A MODE OF OPERATION. IN THE HAND POSITION, THE UNIT SHALL RUN IN THE OCCUPIED MODE.
- UNIT IS TO BE KEPT IN THE AUTOMATIC POSITION. "HAND" AND "OFF" POSITIONS ARE TO BE USED TEMPORARILY FOR MAINTENANCE FUNCTIONS.
- WHEN THE H-O-A SELECTOR IS IN THE HAND OR AUTO POSITION, THE CONTROLS SHALL BE FUNCTIONAL. IN THE OFF POSITION ALL FANS SHALL BE DE-ENERGIZED AND ALL CONTROLLED DEVICES SHALL ASSUME THEIR "NORMAL" POSITION.

2 UNIT START UP

- ON START UP THE SUPPLY AND RETURN AIR FIRE/SMOKE DAMPERS SHALL BE COMMANDED TO OPEN.
- UPON THE DAMPER END SWITCHES PROVING THE DAMPERS HAVE OPENED, THE SUPPLY AND RETURN FANS SHALL BE ENABLED TO RUN.
- ON BEING ENABLED TO RUN THE SUPPLY AND RETURN FAN AUTOMATIC ISOLATION DAMPERS SHALL BE COMMANDED TO OPEN. WHEN ALL DAMPER END SWITCHES PROVE THE DAMPERS ARE ALL OPEN, THE SUPPLY AND RETURN FANS SHALL BE COMMANDED TO START.
- IF A DAMPER END SWITCH DOES NOT CLOSE TWO MINUTES AFTER THE DAMPERS ARE COMMANDED TO OPEN, THE OTHER FANS WITH OPEN DAMPERS, SHALL START UP.
- ON COMMAND TO START, THE SUPPLY FANS SHALL ACCELERATE AT THE RATE OF ZERO SPEED TO MAXIMUM SPEED OVER A PERIOD OF TWO MINUTES. WHEN THE DUCT PRESSURE CONTROL IS SATISFIED, THE FANS SHALL BE UNDER THAT CONTROL.
- THE RETURN FANS SHALL START THE SAME TIME AS THE SUPPLY FANS AND SHALL ACCELERATE AT THE SAME RATE AS THE SUPPLY FANS FOR A PERIOD OF TWO MINUTES. WHEN THE DUCT PRESSURE CONTROL IS SATISFIED, THE FANS SHALL BE UNDER THAT CONTROL.
- AFTER THE SUPPLY FANS HAVE ESTABLISHED DUCT STATIC PRESSURE CONTROL, THE MINIMUM OUTSIDE AIR CONTROL, THE ECONOMIZER CONTROL, STEAM PREHEAT COIL CONTROL, COOLING COIL CONTROL AND THE HUMIDIFIER CONTROLS SHALL BE ENERGIZED.

3 SUPPLY FAN SPEED CONTROL

- FAN SPEED SHALL BE CONTROLLED TO MAINTAIN SUPPLY DUCT STATIC PRESSURE SETPOINT AS SENSED BY SPT-1. INITIAL SETPOINT IS TO BE 1.5 INCHES W.G.
- CONTROL SPEED SIGNAL TO BOTH FAN VFDs IS TO BE THE SAME VALUE.
- RETURN FAN SPEED CONTROL
- FAN SPEED SHALL BE CONTROLLED TO MAINTAIN RETURN DUCT STATIC PRESSURE SETPOINT AS SENSED BY SPT-2. INITIAL SETPOINT IS TO BE 1.0 INCHES W.G.
- CONTROL SPEED SIGNAL TO BOTH FAN VFDs IS TO BE THE SAME VALUE.
- OUTSIDE AIR/ECONOMIZER CONTROL
- OUTSIDE AIR TEMPERATURE AND HUMIDITY IS TO BE SENSED BY TT-2 AND MT-2. THESE VALUES ARE TO BE USED TO ESTABLISH OUTSIDE AIR ENTHALPY. WHEN OUTDOOR AIR ENTHALPY IS BELOW 25 BTU/LB AND OUTSIDE AIR IS BELOW 75 DEGREES, THE ECONOMIZER OPERATION IS TO BE ENABLED.
- IN OCCUPIED MODE AND WHEN THE ECONOMIZER MODE IS NOT ENABLED, RELIEF DAMPER D-3 SHALL BE APPROXIMATELY 25% OPEN AND THE CONTROL SHALL MAINTAIN A MINIMUM FLOW OF OUTSIDE AIR. ON A FALL BELOW MINIMUM OUTSIDE AIR FLOW SETPOINT, AS SENSED BY FT-9, MINIMUM AIR DAMPERS D-4 ARE TO BE MODULATED OPEN AND THE RETURN AIR DAMPERS D-2 ARE TO BE MODULATED CLOSED TO MAINTAIN MINIMUM OUTSIDE AIRFLOW QUANTITY. ON A RISE ABOVE AIR FLOW SETPOINT, THE REVERSE ACTION SHALL OCCUR.
- IN BOTH ECONOMIZER ENABLED AND UNABLED CONDITIONS, IN THE UNOCCUPIED PERIODS, MINIMUM OUTSIDE AIR DAMPERS D-4 ARE TO BE CLOSED.
- IN OCCUPIED MODE, WHEN ECONOMIZER OPERATION IS ENABLED, THE MINIMUM OUTSIDE DAMPER D-4 POSITION SHALL CONTINUE TO BE MODULATED TO MAINTAIN MINIMUM OUTSIDE AIRFLOW. ON A FALL BELOW THE MIXED AIR SETPOINT OF 49 DEGREES AS MEASURED BY TT-3, ECONOMIZER AND EXHAUST AIR DAMPERS ARE TO BE MODULATED OPEN, IN UNISON, AND THE RETURN AIR DAMPERS SHALL BE SIMULTANEOUSLY MODULATED CLOSED. ON A RISE ABOVE SETPOINT THE REVERSE SHALL OCCUR.
- IN UNOCCUPIED MODE AND WITH THE ECONOMIZER ENABLED, THE SAME SEQUENCE AS DESCRIBED IN 5.4 SHALL OCCUR EXCEPT THE MINIMUM OUTSIDE AIR DAMPERS SHALL BE CLOSED.

6 TEMPERATURE CONTROL

- STEAM PREHEAT COIL: THE CONTROL VALVE SHALL BE MODULATED TO MAINTAIN COIL LEAVING TEMPERATURE, AS SENSED BY TT-4 TO A SETPOINT OF 48 DEGREES.
- CHILLED WATER COOLING COIL: THE TWO WAY CONTROL VALVE SHALL BE MODULATED TO MAINTAIN A COIL LEAVING SETPOINT. SETPOINT SHALL BE 50 DEGREES DURING OCCUPIED PERIODS AND 60 DEGREES DURING UNOCCUPIED PERIODS.
- HUMIDITY CONTROL
- THE RETURN AIR RELATIVE HUMIDITY, SENSED BY MT-1, SHALL BE USED TO RESET THE SETPOINT OF HUMIDIFIER CONTROL
- WHEN THE RETURN AIR HUMIDITY IS 33 PERCENT RH OR ABOVE THE HUMIDIFIER IS INACTIVE.
- WHEN THE RETURN AIR HUMIDITY FALLS TO 31 PERCENT RH, THE HUMIDIFIER CONTROL SHALL BECOME ACTIVE AND THE SETPOINT SHALL BE 30 GRAINS/LBDA.
- THE RETURN AIR RELATIVE HUMIDITY SHALL LINEARLY RESET THE HUMIDIFIER CONTROL SETPOINT TO 36 GRAINS/LBDA WHEN THE RETURN AIR HUMIDITY FALLS TO 25 PERCENT RH.
- THE HUMIDIFIER CONTROL BLOCK VALVE SHALL OPEN AND THE HUMIDIFIER CONTROL VALVE SHALL BE MODULATED TO MAINTAIN THE CONTROL SETPOINT WHEN THE HUMIDIFIER IS ACTIVE.
- IF THE RETURN AIR DEW POINT RISES ABOVE 55 DEGREES DURING OCCUPIED MODE AND THE CHILLED WATER TEMPERATURE PRODUCED BY THE CENTRAL CHILLER PLANT IS PRODUCING CHILLED WATER ABOVE 46 DEGREES OR HAS BEEN SHUT DOWN, THE EMERGENCY CHILLER SHALL BE ACTIVATED TO PROVIDE THE REQUIRED CHILLED WATER AND NOTIFICATION OF THIS ACTION SHALL BE DISPLAYED AT THE ECC. THE ESTABLISHING OF THE CHILLER PLANT STATUS SHALL REQUIRE BAS GLOBALLY AVAILABLE DATA. THE INITIALIZATION OF THE CHILLER PLANT SHALL BE SUPPRESSED FOR TEN MINUTES AFTER CHANGEOVER FROM UNOCCUPIED TO OCCUPIED AHU OPERATION MODE.

8 SAFETIES

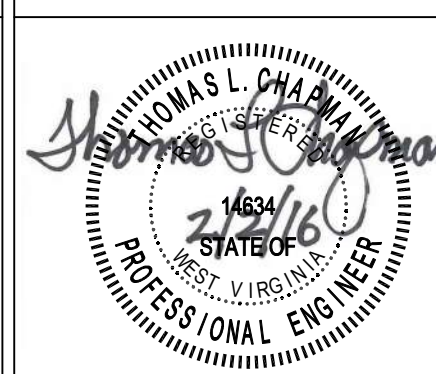
- UNIT RUN ENABLE SAFETIES INCLUDE:
 - SUPPLY AIR SMOKE DAMPER END SWITCH
 - RETURN AIR SMOKE DAMPER END SWITCH
 - SUPPLY AIR HIGH PRESSURE SWITCH, PSH-1. SETPOINT - +4.0 INCHES W.G. SWITCH SHALL HAVE MANUAL ONLY RESET.
 - RETURN AIR LOW PRESSURE SWITCH, PSL-1. SETPOINT - -4.0 INCHES W.G. SWITCH SHALL HAVE MANUAL ONLY RESET.
 - GENERAL SMOKE/FIRE CONDITION SIGNAL FROM SMOKE DETECTION SYSTEM
 - FREEZE/STAT, TSL-1. SETPOINT - 35 DEGREES
 - ALL FAN VFD START CONTACTS ARE TO BE HARD WIRED THROUGH THE UNIT SAFETIES TO PREVENT RUN CONDITION IN BOTH THE "AUTO" AND "HAND" POSITIONS OF THE UNIT H-O-A SELECTOR SWITCH.
 - IN ADDITION TO THE OVERALL UNIT SAFETIES, EACH SUPPLY FAN AND RETURN FAN ISOLATION DAMPER SHALL BE HARD WIRED INTO INDIVIDUAL FAN RUN ENABLE CIRCUITS IN BOTH THE "HAND" AND "AUTO" POSITION OF THE INDIVIDUAL FAN H-O-A SELECTOR SWITCH.

9 ALARM AND FAULT HANDLING

- ALARM CONDITION SHALL BE ANNUNCIATED AT THE ECC WHEN ANY OF THE UNIT SAFETIES; PSH-1, PSL-1, SMOKE DAMPER END SWITCHES AND FREEZE/STAT ARE NOT SATISFIED. THE DAMPER END SWITCH ALARMS SHALL BE REPPRESSED FOR ONE MINUTE AFTER UNIT START TO ALLOW DAMPERS TO OPEN.
- SUPPLY AND RETURN FAN ISOLATION DAMPER END SWITCHES SHALL BE ANNUNCIATED AT THE ECC UPON FAILURE TO DETECT OPEN CONDITION. THE DAMPER END SWITCH ALARMS SHALL BE REPPRESSED FOR ONE MINUTE AFTER FAN RUN INITIATION TO ALLOW DAMPERS TO OPEN. THIS CONDITION SHALL SHUT DOWN THE ASSOCIATED FAN ONLY AND THE OTHER REMAINING FANS SHALL BE ALLOWED TO PROVIDE THE REQUIRED CAPACITY.
- IF THE HUMIDIFIER IS ACTIVE AND THE DISCHARGE HUMIDITY RISES ABOVE 90 PERCENT, THE HUMIDIFIER SHALL BE SHUT DOWN AND ALARM SHALL BE ANNUNCIATED AT THE ECC.
- THE ALARMS INDICATED IN THE POINTS LIST SHALL BE ANNUNCIATED AT THE ECC.
- LOSS OF NORMAL POWER/BAS - INDEXED SHUTDOWN AND AUTOMATIC RESTART
- UPON LOSS OF NORMAL POWER, THE AHU SHALL RESTART AND CONTINUE TO RUN.
- THE EMERGENCY CHILLED WATER CAPACITY FEEDING 1S-AC-16 IS ALSO FEEDING UNITS 1S-AC-8 AND 10.
- WHEN THE CHILLED WATER CONTROL VALVE OF 1S-AC-16 IS CONTROLLED TO ITS WIDE OPEN POSITION, THE CHILLED WATER FLOW CONTROL VALVE OF 1S-AC-10 SHALL BE MODULATED MORE CLOSED THAN THE CONTROL SEQUENCE OF THE UNIT CALLS FOR. THE CONTROL VALVE OF 1S-AC-10 SHALL BE MODULATED, IN 10 PERCENT STEPS, WITH TIME INCREMENTS OF ONE MINUTE, UNTIL 1S-AC-AC CHILLED WATER CONTROL VALVE IS LESS THAN 95 PERCENT OPEN.
- RESTARTING OF THESE UNITS ON EMERGENCY POWER SHALL BE STAGGERED TO LIMIT THE STARTUP SURGE OF POWER REQUIRED BY THE GENERATOR. UNIT 1S-AC-16 IS TO BE THE FIRST TO START ON TRANSFEREE TO EMERGENCY POWER FOLLOWED IN 20 SECONDS BY 1S-AC-8 AND 20 SECONDS LATER BY 1S-AC-10. THIS STAGGERED START SHALL ALSO BE FOLLOWED ON THE RESUMPTION OF NORMAL POWER.

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PROFESSIONAL ENGINEER



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Drawing Title MECHANICAL CONTROLS
Approved: Medical Center Director

Project Title RENOVATE SURGICAL SERVICE & UPGRADE OPERATING ROOMS
Location HUNTINGTON, WV
Date 01-15-2016

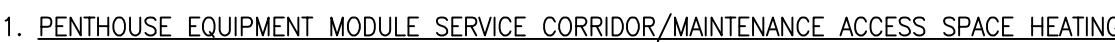
Project Number 581-13-101
Building Number 1S
Drawing Number M8.01

Office of
Construction
and Facilities
Management

Department of
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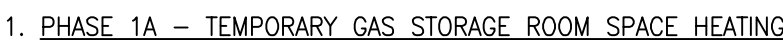
**100% CONSTRUCTION DOCUMENTS
FULLY SPRINKLERED**

3



- 1.1 BAS TO INCLUDE TWO TEMPERATURE SENSORS WITHIN THE PEM. ONE FOR EACH ACCESS AREA ON EACH SIDE OF THE AHU/AIR TUNNEL. EACH SENSOR WILL REPRESENT A TEMPERATURE CONTROL ZONE.
- 1.2 TWO UNIT HEATERS WILL BE PLACED ON EACH SIDE OF THE AHU/AIR TUNNEL (QTY 4 UNIT HEATERS). AN AIRFLOW CONTROL VALVE WITH HOT WATER REHEAT COIL WILL ALSO BE INSTALLED TO SERVE EACH HEATER. THE AHU/AIR TUNNEL SHALL BE PROVIDED WITH HEAT EXCHANGERS AND AFCSH SHALL BE GROUPED FOR OPERATION BASED ON THE SIDE OF THE AHU THEY DISCHARGE TO.
- 1.3 AIRFLOW CONTROL VALVES/REHEAT COILS SERVING THE PEM ACCESS AREAS/SERVICE CORRIDORS SHALL BE THE FIRST HEATING SOURCE FOR THE PEM IN ACCORDANCE WITH REHEAT TEMPERATURE CONTROL SEQUENCES INCLUDED WITH ZONE/SPACE CONTROLS DIAGRAMS (SEE M8.03 FOR ADDITIONAL INFORMATION). STEAM UNIT HEATERS REPRESENT FREEZE PROTECTION/BACK-UP HEATING FOR PEM.
- 1.4 UPON A BAS SYSTEM CALL FOR HEATING WITHIN THE PEM, THE BAS SHALL FIRST ENGAGE AIRFLOW CONTROL VALVE/REHEAT CONTROL SEQUENCE. IF SPACE TEMPERATURE CONTINUES TO DROP BELOW THE SET POINT, THE BAS SHALL THEN ENGAGE THE STEAM UNIT HEATER. STEAM CONTROL VALVES SHALL ENGAGE UNIT HEATER FAN MOTORS TO MAINTAIN TEMPERATURE SET POINT. SHOULD SPACE TEMPERATURE CONTINUE TO FALL, BAS SHALL GENERATE AN ALARM. WHEN SPACE TEMPERATURE REACHES THE F+ADJ. SET POINT, THE BAS SHALL STOP STEAM CONTROL VALVES SHUTTING THEM CLOSE. UNIT HEATER FAN MOTORS SHALL CONTINUE TO OPERATE FOR TEN MINUTES (ADJ.) FOLLOWING CLOSURE OF STEAM CONTROL VALVES AND THEN STOP.
- 1.5 ALL SET POINTS SHALL BE ADJUSTABLE

NTS



- 1.1 BAS TO INCLUDE LOCAL TEMPERATURE SENSE WITHIN THE TEMPORARY GAS STORAGE ROOM (PHASE 1A) THROUGH COMPLETION OF PHASE 4A), REPRESENTING THE HEATING/VENTILATION TEMPERATURE CONTROL ZONE.
- 2.1 BAS TO MONITOR RELOCATED/EXISTING EXHAUST FAN 15-EF-11 FOR GENERAL FALLOUT/TAILORED SINGLE HOT WATER UNIT HEATER WILL BE PLACED WITHIN THE SPACE ADJACENT TO THE NEW OUTDOOR AIR MAKE-UP/INTAKE WALL LOUVER/INTAKE FILER ASSEMBLY. AN EXISTING SUSPENDED INLINE EXHAUST FAN (EXIST. EF-11) WILL BE RELOCATED/REMOVED AND SHALL BE INSTALLED ABOVE THE NEW MAKE-UP/INTAKE LOUVER TO PROVIDE EXHAUST OF THE GAS STORAGE ROOM. THE EXHAUST FAN SHALL OPERATE CONTINUOUSLY WHILE THE UNIT HEATER SHALL OPERATE ONLY UPON A BAS CALL FOR HEATING.
- 1.3 UPON A BAS SYSTEM CALL FOR HEATING WITHIN THE TEMPORARY GAS STORAGE ROOM, THE BAS SHALL MODULATE UNIT HEATER HEATING HOT WATER CONTROL VALVE AND ENGAGE THE UNIT HEATER FAN MOTOR TO MAINTAIN TEMPERATURE SET POINT. SHOULD SPACE TEMPERATURE CONTINUE TO FALL, BAS SHALL OPERATE AT MAXIMUM OF THE GAS STORAGE ROOM. THE HEATING HOT WATER CONTROL VALVE OPERATING SEQUENCE SHALL STOP. HEATING HOT WATER CONTROL VALVE SHALL CLOSE. UNIT HEATER FAN MOTOR SHALL CONTINUE TO OPERATE FOR TEN MINUTES (ADJ.) FOLLOWING CLOSURE OF HEATING HOT WATER CONTROL VALVE AND THEN STOP.
- 1.4 ALL SET POINTS SHALL BE ADJUSTABLE.
- 1.5 COORDINATE REMOVAL OF UNIT HEATER, EXHAUST FAN AND ALL ASSOCIATED CONTROLS AND TURN OVER TO THE OWNER AT COMPLETION OF PHASE 4A/COMMISSIONING OF NEW GAS STORAGE ROOM IN PHASE 4A PROJECT AREA.

2



1. GAS STORAGE ROOM EXHAUST FAN
- _1.1 THE BAS SHALL HAVE START-STOP CAPABILITY OVER THE FAN.
- 1.2 THE FAN SHALL BE CONNECTED TO EMERGENCY POWER AND SHALL RUN CONTINUOUSLY.
- 1.3 THE BAS SHALL MONITOR FAN STATUS AND SHALL ALARM IF FAN FAILS.
- 1.4 THE FAN SHALL INCLUDE EC MOTOR WITH REMOTE DIAL FAN SPEED ADJUSTMENT THAT SHALL BE MOUNTED ON WALL WITHIN GAS STORAGE ROOM.

1

VA FORM 08-6231

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Drawing Title

MECHANICAL CONTROLS

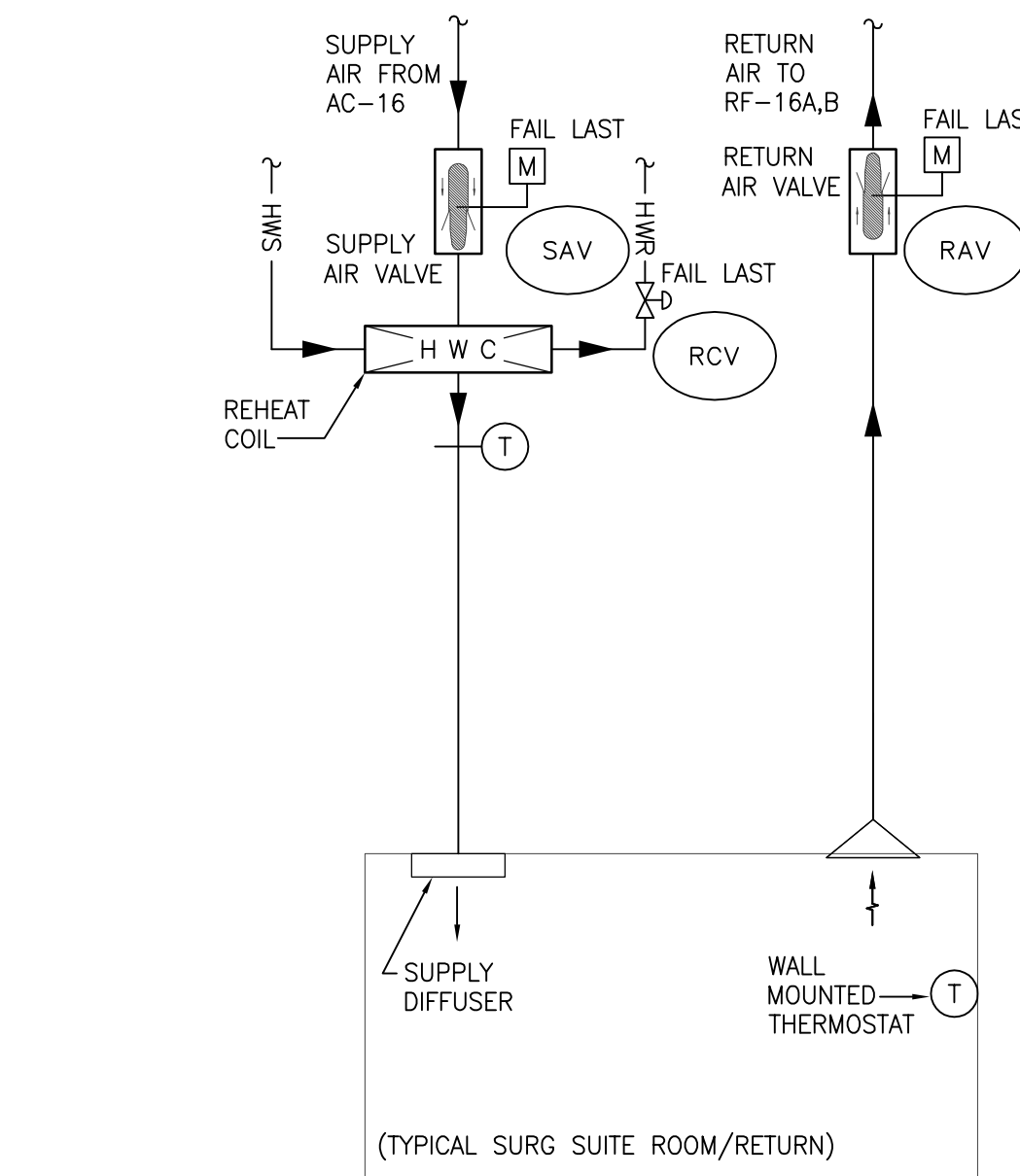
Project Title

**RENOVATE SURGICAL
SERVICE & UPGRADE
OPERATING ROOMS**

**Department of
Veterans Affairs**

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- COORDINATE FINAL LOCATIONS OF SPACE REFERENCE PRESSURE SENSORS, PRESSURE MONITORS, PRESSURIZATION ALARM OVERRIDE KEY-SWITCHES, ROOM THERMOSTATS/TEMPERATURE SENSORS, HUMIDITY SENSORS, OCCUPANCY SENSORS, UNOCCUPIED OVERRIDE PUSH BUTTONS AND OTHER WALL-MOUNTED CONTROLS DEVICES AS PER PLAN DRAWINGS, SPECIFICATIONS AND VAMC SITE ENGINEERING PERSONNEL REVIEW.
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- REFER TO DETAIL SHEETS AND ALL CONTROL DIAGRAMS FOR ADDITIONAL CONTROLS REQUIREMENTS ASSOCIATED WITH PEM, AHU, SMOKE DAMPERS AND REHEAT COIL INSTALLATIONS, ETC.



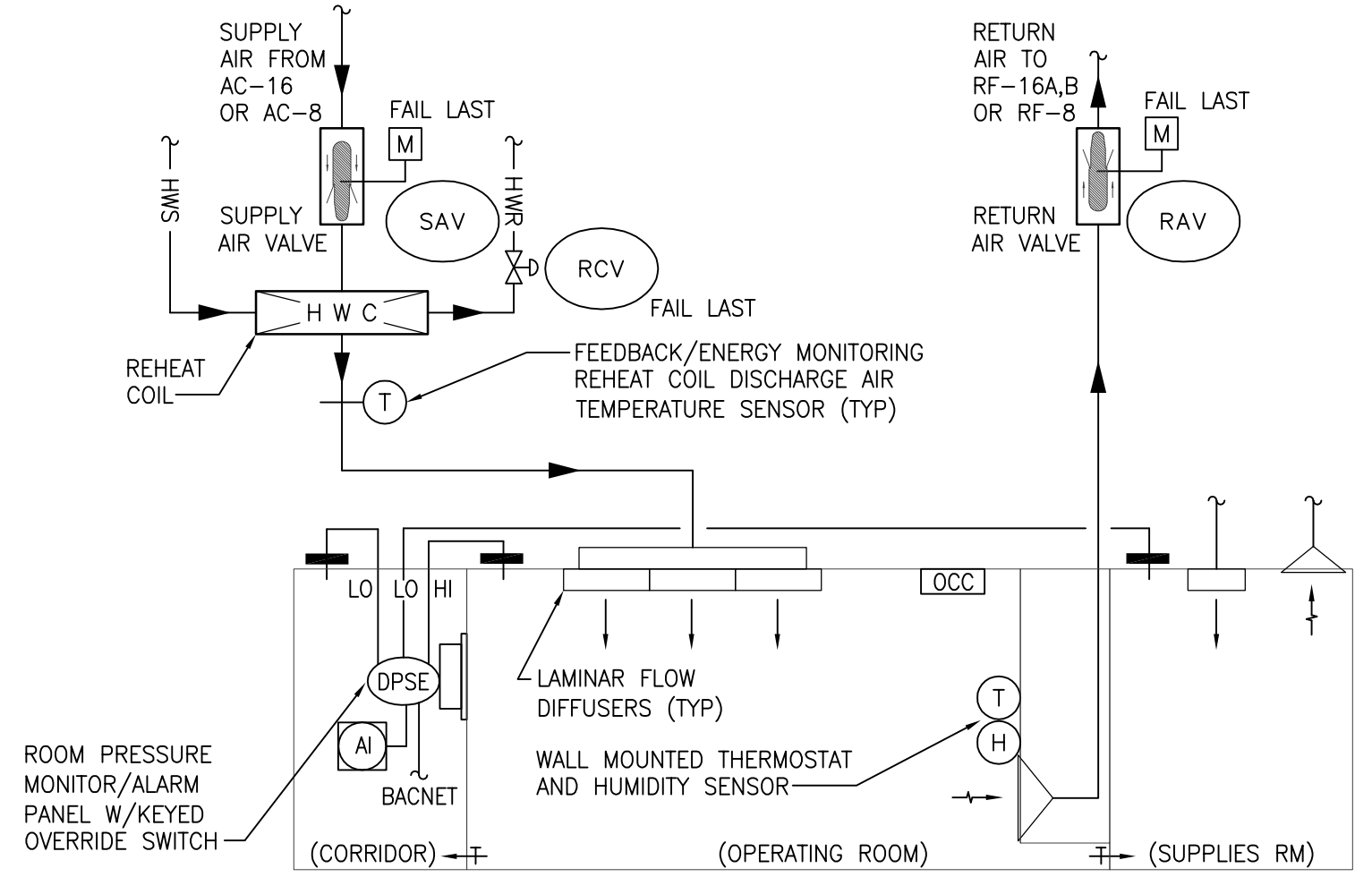
- THE SUPPLY, RETURN AND/OR EXHAUST AIR FLOW CONTROL VALVES (ACV/ALVES) SHALL BE PRESSURE INDEPENDENT AND SHALL MAINTAIN CONSTANT AIR FLOW BASED UPON THE ENGAGED OPERATIONAL SEQUENCE FOR THE THIRD FLOOR NEW SURGICAL SUITE (OCC/UNOCC/SMOKE PURGE/WARM-UP MODES). A DIFFERENTIAL BETWEEN THE SUPPLY AND RETURN OR SUPPLY AND EXHAUST (AS NOTED ON DWG. M7.00) SHALL BE MAINTAINED TO INSURE PRESSURIZATION IN THE SPACES AT ALL TIMES. SPACES SHALL BE NEUTRAL TO ADJACENCIES DURING SMOKE PURGE. SEE AIRFLOW CONTROL VALVE SCHEDULE FOR MORE INFO.
- AIR QUANTITIES FOR ALL VALVES SHALL BE FULLY ADJUSTABLE WITHIN THE BAS. SUPPLY, RETURN AND EXHAUST AIRFLOW AND ROOM TEMPERATURE SHALL BE MEASURED, MONITORED AND ALARMED WITHIN THE BAS FOR EACH SPACE.
- NORMAL OCCUPIED AND UNOCCUPIED MODES MAINTAIN THE TYPICAL ROOMS AT AIRFLOW OFFSETS AND RELATIVE PRESSURES AS PER DWG. M7.00. TYPICAL SURGICAL SUITE ROOMS DO NOT INCLUDE ROOM PRESSURE MONITORING, HOWEVER, BAS CONTRACTOR SHALL ASSIST TAB CONTRACTOR IN TEST VERIFICATION AND DOCUMENTATION OF EACH OPERATING MODE AND THAT TYPICAL ROOMS MAINTAIN DESIGN INTENT AIRFLOW OFFSETS AS SCHEDULED AND AS INDICATED ON DRAWING M7.00.
- THE ROOM TEMPERATURE SENSORS SHALL PROVIDE REHEAT COIL CONTROL AS DESCRIBED IN AIRFLOW CONTROL VALVE SEQUENCES.

TYPICAL SURGICAL SUITE ROOMS (NON-OR'S)

NTS

DIFFERENTIAL PRESSURE CONTROL w/ MONITOR/ALARM SEQUENCE OF OPERATION (OPERATING ROOMS)

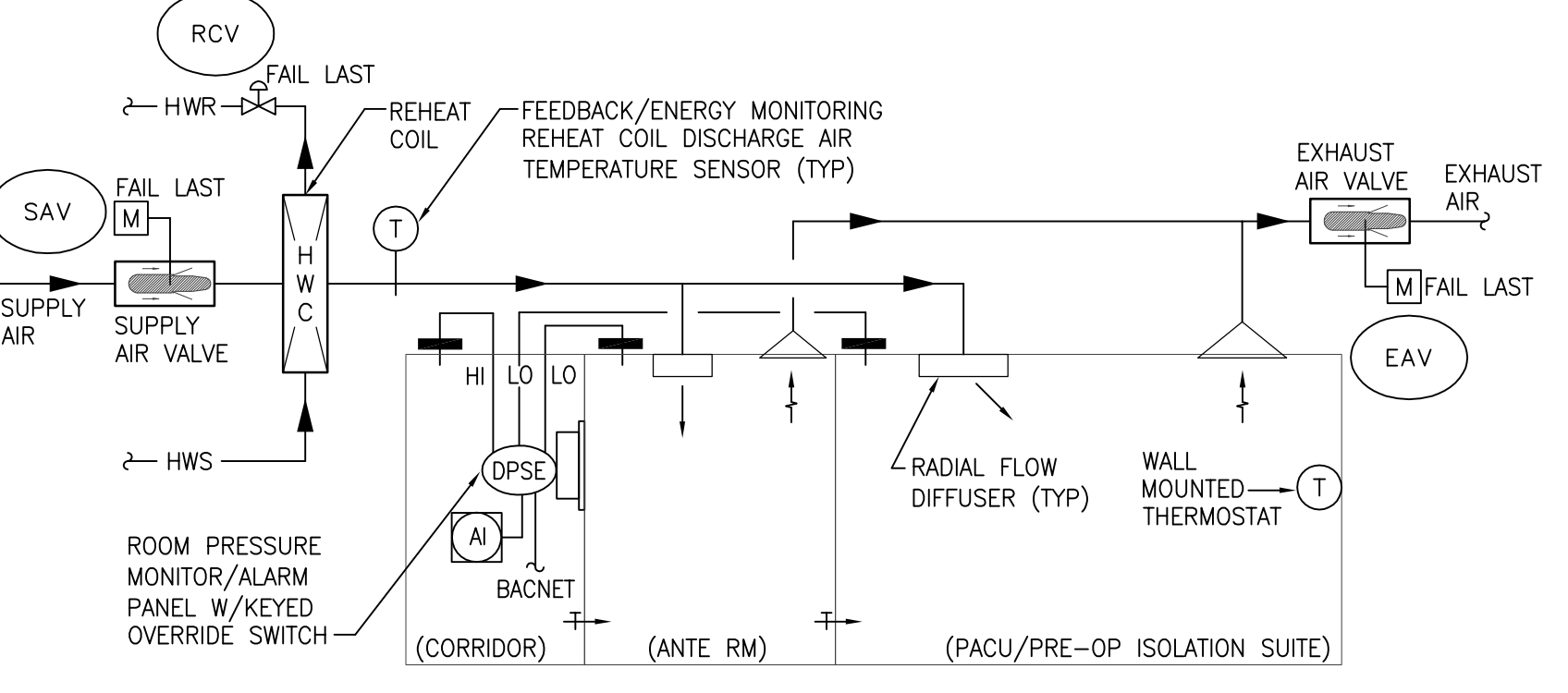
- GENERAL
 - A ROOM DIFFERENTIAL PRESSURE MONITOR (TSI OR APPROVED EQUAL), WITH KEYED OVERRIDE SWITCH, SHALL CONTINUOUSLY MONITOR/ALARM THE ROOM DIFFERENTIAL PRESSURE AT EACH OPERATING ROOM AS REFERENCED TO ITS ADJACENT SPACE(S). AN ADDITIONAL SUMMARY MONITORING & ALARM PANEL SHALL BE PROVIDED AT THE MAIN SURGICAL SUITE NURSE STATION (CONTROL 3B-159) TO DISPLAY STATUS AND ALARMS FOR ALL SIX OPERATING ROOMS AND THEIR ASSOCIATED ADJACENCIES. ALL DIFFERENTIAL PRESSURE MONITORS AND KEYED OVERRIDE SWITCHES SHALL BE ON "EMERGENCY" POWER.
 - WHEN THE ROOM DIFFERENTIAL PRESSURE IS WITHIN ITS ACCEPTABLE PRESSURE ALARM PARAMETERS (MINIMUM DIFFERENTIAL OF 0.01 IN. WC/2.5 Pa, ADJUSTABLE), AS SET AT THE ROOM DIFFERENTIAL PRESSURE MONITOR/ALARM, THE GREEN "NORMAL" LIGHT SHALL BE ILLUMINATED. WHEN THE ROOM DIFFERENTIAL PRESSURE IS NOT WITHIN ITS ACCEPTABLE PRESSURE ALARM PARAMETERS, THE RED "ALARM" LIGHT SHALL BE ILLUMINATED AND THE ROOM DIFFERENTIAL PRESSURE MONITOR/ALARM SHALL PRODUCE A LOCAL AUDIBLE ALARM. AN ALARM SHALL ALSO BE GENERATED AT THE BAS WORKSTATION(S).
 - ROOM PRESSURE SENSORS SHALL BE PROVIDED BETWEEN OPERATING ROOM AND ADJACENT CORRIDOR AND THE OPERATING ROOM AND THE ADJACENT SUPPLIES/CLEAN CORE ROOMS.
 - EACH ROOM SHALL HAVE ITS OWN MONITOR MOUNTED AS INDICATED ON PLANS. MONITOR SHALL HAVE A LCD DISPLAY WITH KEYPAD, ROOM ALARM STATUS INDICATOR, VISUAL AND AUDIBLE ALARM ANNUNCIATOR, ALARM RELAY OUTPUT, ANALOG PRESSURE OUTPUT (MA OR VDC TO BE MONITORED BY BAS), SERIAL ASYNCHRONOUS COMMUNICATIONS PORT UTILIZING ASCII OR BACNET MS/TP PROTOCOL, ALARM SILENCE VIA KEYPAD, TEST VIA KEYPAD, AND ISOLATED POWER SUPPLY. SUMMARY PANEL AT NURSE STATION/CONTROL 3B-159 SHALL BE SIMILAR IN APPEARANCE AND FUNCTION TO INDIVIDUAL SPACE MONITORS, BUT PROVIDE OVERALL SUMMARY SCREENS INDICATING FULL STATUS OF THE SIX OPERATING ROOMS/ASSOCIATED KEY SWITCHES AT ONE GLANCE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 - EACH MONITOR SHALL HAVE A KEYED OVERRIDE SWITCH THAT ALLOWS THE MONITOR TO BE TAKEN OUT OF SERVICE FOR SPECIFIC/USER-DEFINED PERIODS WHEN SPACES ARE NOT IN USE FOR SURGICAL/STERILE OPERATIONS (CLEANING/MAINTENANCE/AFTER-HOURS, ETC.). WHEN THE KEYED OVERRIDE SWITCH IS PLACED IN THE "NEUTRAL" POSITION THE ROOM MONITOR DISPLAY INDICATOR SHALL CHANGE FROM "POSITIVE" TO "NEUTRAL". WHEN THE KEYED OVERRIDE SWITCH IS PLACED IN THE "POSITIVE" POSITION THE DISPLAY SHALL CHANGE FROM "NEUTRAL" TO "POSITIVE". NO HVAC AIRFLOW CHANGES SHALL OCCUR, JUST DISABLING OF LOCAL AND REMOTE/BAS ALARMS. BASED UPON VAMC PROTOCOL/AUTHORIZED PERSONNEL USAGE OF KEY SWITCH.
 - ROOM DIFFERENTIAL PRESSURE IS TO BE ACTIVELY CONTROLLED BY THE ROOM DIFFERENTIAL CONTROLLER/MONITOR. THE SUPPLY AIR QUANTITY TO THE SPACE IS TO BE CONSTANT AND THE SETPOINT FOR THE OCCUPIED AND UNOCCUPIED MODES SHALL BE AS DEFINED IN THE AIR VALVE SCHEDULE.
 - THE RETURN AIR VALVE SETPOINT ON START UP OR CHANGE OF OCCUPIED/UNOCCUPIED STATUS IS TO BE AS INDICATED ON THE AIR VALVE SCHEDULE. AFTER THE INITIAL AIRFLOW SETPOINTS HAVE BEEN ESTABLISHED, THE ROOM DIFFERENTIAL PRESSURE CONTROLLER/MONITOR SHALL RESET THE RETURN AIR VALVE SETPOINT TO CONTROL THE SPACE PRESSURE TO 0.025 INCHES W.G. POSITIVE TO THE ADJACENT TO THE ADJACENT SPACES. THE RESETING OF THE CFM SETPOINT SHALL BE LIMITED TO + 20% AND - 10% OF THE SCHEDULED VALUE FOR THE OCCUPIED OR UNOCCUPIED MODE.
- OCCUPANCY SENSOR OVERRIDES:
 - THE OCCUPANCY SENSOR SHALL OVERRIDE THE SPACE OCCUPIED/UNOCCUPIED MODE FOR CONTROLLING THE AIR VALVE FLOW SETPOINT.
 - IF THE ROOM IS SCHEDULED TO BE OCCUPIED AND OCCUPANCY IS NOT SENSED FOR 10 MINUTES, THE SUPPLY AND RETURN AIR VALVE FLOW SETPOINTS SHALL BE SET TO THE UNOCCUPIED MODE VALUES.
 - ON OCCUPANCY BEING SENSED, THE OCCUPANCY SCHEDULE SHALL BE OVERRIDDEN AND THE SUPPLY AND RETURN AIR VALVES FLOW AND THE SPACE TEMPERATURE SETPOINTS SHALL BE SET TO THE OCCUPIED MODE VALUES. AIR UNIT 15-AHU-16 SHALL OPERATE IN THE OCCUPIED MODE.



- THE SUPPLY AND RETURN AIR FLOW CONTROL VALVES (ACV/ALVES) SHALL BE PRESSURE INDEPENDENT AND SHALL MAINTAIN CONSTANT AIR FLOW BASED UPON THE ENGAGED OPERATIONAL SEQUENCE FOR THE THIRD FLOOR NEW SURGICAL OPERATING ROOM SUITES (OCC/UNOCC/WARM-UP MODES).
- AIR QUANTITIES FOR ALL AIRFLOW CONTROL VALVES SHALL BE FULLY ADJUSTABLE WITHIN THE BAS. SUPPLY AND EXHAUST AIRFLOW, ROOM TEMPERATURE, ROOM HUMIDITY AND ROOM PRESSURE SHALL BE MEASURED, MONITORED AND ALARMED WITHIN THE BAS FOR EACH SPACE.
- POSITIVE PRESSURE/STERILE OPERATING ROOMS SHALL INCLUDE ACTIVE ROOM PRESSURE CONTROL/MONITORING WITH LOCAL AND BAS MEASUREMENT, MONITORING AND ALARM. LOCAL ROOM PRESSURE MONITOR PANELS (TSI OR APPROVED EQUAL-SEE PLANS FOR LOCATIONS) SHALL INCLUDE KEY SWITCH TO ALLOW LOCAL AND REMOTE/BAS ALARMS TO BE DISABLED WHEN SPACES ARE BEING CLEANED/AFTER-HOURS/DURING PERIODS OF NON-USE/UNOCCUPIED. BAS OPERATING MODE IS NOT CHANGED AS SPACES CONTINUE TO MAINTAIN CONSTANT VOLUME AIRFLOW PER THE ACTIVE SEQUENCE (OCC/UNOCC). BAS CONTINUES TO MONITOR PRESSURE, ONLY THE ALARMS ARE DISENGAGED TO ALLOW FOR ROOM CLEANING, DOOR OPENINGS, ETC. BASED ON VAMC STANDARD OPERATING PROCEDURES/QUALIFIED PERSONNEL USE OF THE KEY/KEY SWITCHES, BAS CONTRACTOR SHALL ASSIST IN THE VERIFICATION AND DOCUMENTATION OF ALL OPERATION MODES AND CONFIRM THAT POSITIVE PRESSURE/STERILE OPERATING ROOMS MAINTAIN POSITIVE AIRFLOW OFFSETS AS SCHEDULED AND AS INDICATED ON DRAWING M7.00. SPACES SHALL BE NEUTRAL TO ADJACENCIES DURING SMOKE PURGE.
- THE OPERATING ROOM TEMPERATURE SENSORS SHALL PROVIDE REHEAT COIL CONTROL AS DESCRIBED IN AIRFLOW CONTROL VALVE SEQUENCES. OCCUPIED TEMPERATURE SETPOINT SHALL BE 66°F IF NOT RESET AT ECC OR LOCALLY AT THE SPACE THERMOSTAT. UNOCCUPIED SETPOINT SHALL BE 66°F. HUMIDITY SENSORS ARE FOR FEEDBACK MONITORING AS INDIVIDUAL OPERATING ROOM HUMIDITY CONTROL IS NOT REQUIRED/PROVIDED IN DESIGN.

ZONE CONTROL TYPE 7 - POSITIVE PRESSURE OPERATING ROOMS - PRESSURE-MONITORED ZONES

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- THE SUPPLY AND EXHAUST AIRFLOW CONTROL VALVES (ACV/ALVES) SHALL BE PRESSURE INDEPENDENT AND SHALL MAINTAIN CONSTANT AIR FLOW AT ALL TIMES NO MATTER WHAT THE ENGAGED OPERATIONAL SEQUENCE FOR THE THIRD FLOOR SURGICAL PACU/PRE-OP SUITES. A DIFFERENTIAL BETWEEN THE SUPPLY AND EXHAUST (AS NOTED ON DWG M7.00) SHALL BE MAINTAINED TO INSURE PRESSURIZATION IN THE SPACES AT ALL TIMES.
- AIR QUANTITIES FOR BOTH VALVES SHALL BE FULLY ADJUSTABLE WITHIN THE BAS. SUPPLY AND EXHAUST AIRFLOW, ROOM TEMPERATURE AND ROOM PRESSURE SHALL BE MEASURED, MONITORED AND ALARMED WITHIN THE BAS FOR EACH SPACE.
- NEGATIVE PRESSURE/ISOLATION PATIENT ROOMS SHALL INCLUDE ACTIVE ROOM PRESSURE MONITORING WITH LOCAL AND BAS MEASUREMENT, MONITORING AND ALARM. LOCAL ROOM PRESSURE MONITOR PANELS (TSI OR APPROVED EQUAL-SEE PLANS FOR LOCATIONS) SHALL INCLUDE KEY SWITCH TO ALLOW LOCAL AND REMOTE/BAS ALARMS TO BE DISABLED WHEN SPACES ARE NOT REQUIRED FOR ISOLATION. BAS OPERATING MODE IS NOT CHANGED AS SPACES CONTINUE TO MAINTAIN CONSTANT VOLUME. BAS CONTINUES TO MONITOR PRESSURE, ONLY THE ALARMS ARE DISENGAGED TO ALLOW FOR ROOM CLEANING, DOOR OPENING, ETC. BASED ON VAMC STANDARD OPERATING PROCEDURES/QUALIFIED PERSONNEL USE OF THE KEY/KEY SWITCHES, BAS CONTRACTOR SHALL ASSIST IN THE VERIFICATION AND DOCUMENTATION OF ALL OPERATION MODES AND THAT NEGATIVE PRESSURE/ISOLATION PATIENT ROOMS MAINTAIN NEGATIVE AIRFLOW OFFSETS AS SCHEDULED AND AS INDICATED ON DRAWING M7.00.
- THE PATIENT ROOM TEMPERATURE SENSORS SHALL PROVIDE REHEAT COIL CONTROL AS DESCRIBED IN AIRFLOW CONTROL VALVE SEQUENCES.

NEGATIVE PRESSURE (AIRBORNE INFECTION) PATIENT ISOLATION ROOMS - PRESSURE-MONITORED ZONES

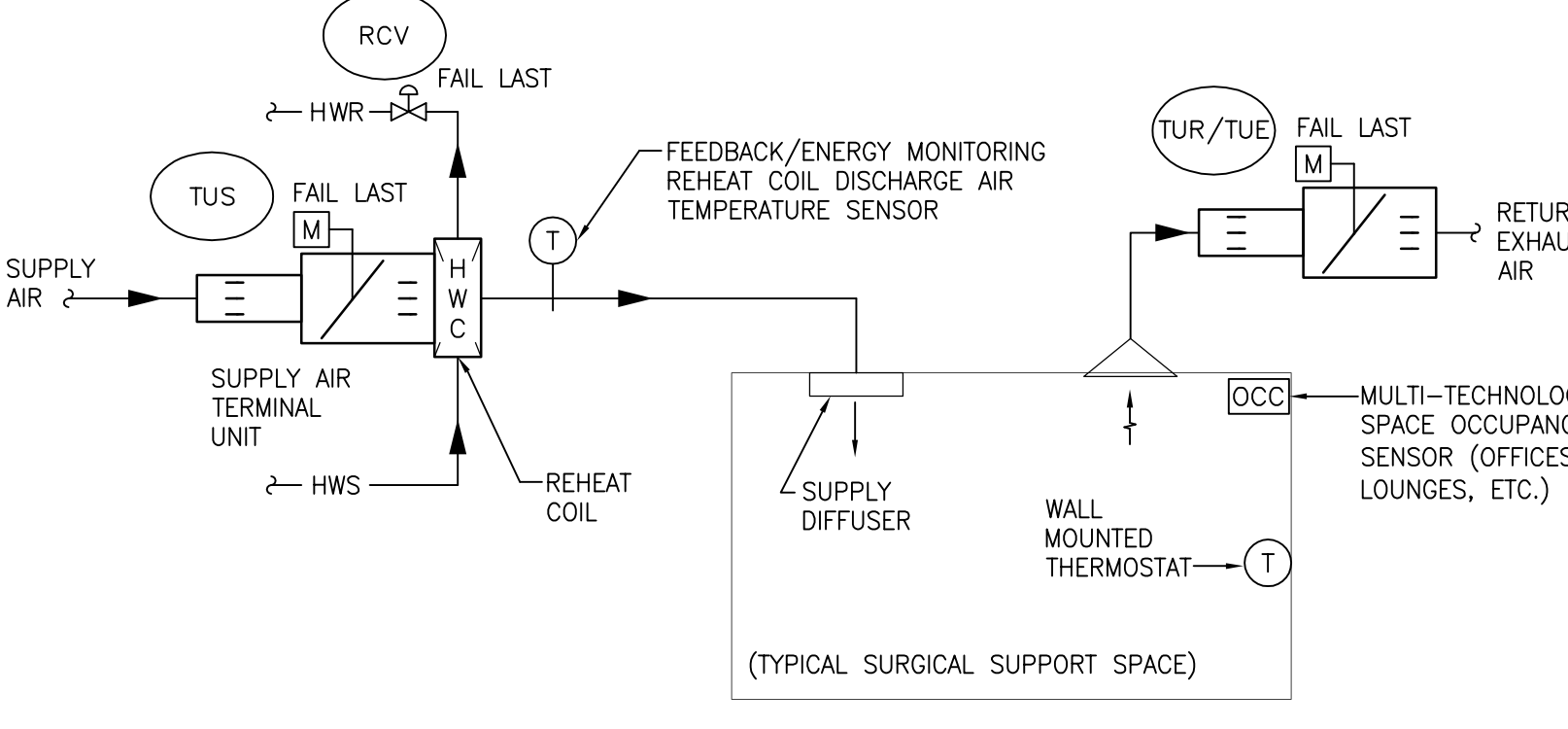
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DIFFERENTIAL PRESSURE MONITOR/ALARM SEQUENCE OF OPERATION (ISOLATION PATIENT ROOMS)

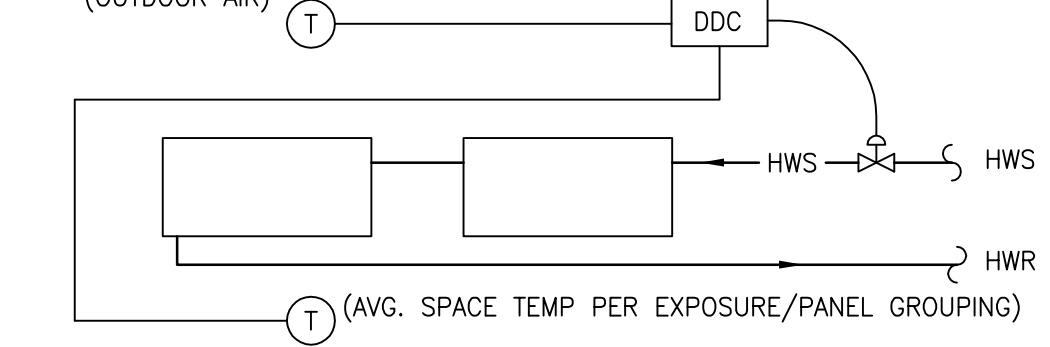
- GENERAL
 - A DIFFERENTIAL PRESSURE BETWEEN NEGATIVE PRESSURE ISOLATION PATIENT ROOMS AND ADJACENT PRE-OP/PACU CORRIDOR SHALL BE A MINIMUM OF -0.01 IN. WC (-2.5 Pa). INITIAL SETPOINT: -0.025 IN. WC (ADJ). COORDINATE TIGHT SEAL OF ISOLATION ROOM ENVELOPE WITH ALL TRADES. EACH PATIENT ROOM SHALL MEET ISOLATION ROOM CRITERIA ACROSS ALL BOUNDARIES: CORRIDOR TO ANTE ROOM, ANTE ROOM TO PATIENT ROOM, AND CORRIDOR TO PATIENT ROOM. THE AIRFLOW PRESSURIZATION CASCADE SHALL BE AS INDICATED ON DRAWING M7.00 AND SHALL BE VERIFIED AS "NEGATIVE" FOR NORMAL OCCUPIED MODE/UNOCCUPIED MODES WITHOUT ALARMS (KEY-SWITCH ENGAGED TO DISABLE ALARMS). BAS SHALL MONITOR PRESSURE DIFFERENTIALS AT ALL TIMES.
 - A ROOM DIFFERENTIAL PRESSURE MONITOR (TSI OR APPROVED EQUAL), WITH KEYED OVERRIDE SWITCH, SHALL CONTINUOUSLY MONITOR/ALARM THE ROOM DIFFERENTIAL PRESSURE AS REFERENCED TO ITS ADJACENT SPACES. THE ROOM DIFFERENTIAL PRESSURE MONITOR AND KEYED OVERRIDE SWITCH SHALL BE ON "EMERGENCY" POWER.
 - WHEN THE ROOM DIFFERENTIAL PRESSURE IS WITHIN ITS ACCEPTABLE PRESSURE ALARM PARAMETERS (MINIMUM DIFFERENTIAL OF 0.01 IN. WC/2.5 Pa, ADJUSTABLE), AS SET AT THE ROOM DIFFERENTIAL PRESSURE MONITOR/ALARM, THE GREEN "NORMAL" LIGHT SHALL BE ILLUMINATED. WHEN THE ROOM DIFFERENTIAL PRESSURE IS NOT WITHIN ITS ACCEPTABLE PRESSURE ALARM PARAMETERS, THE RED "ALARM" LIGHT SHALL BE ILLUMINATED AND THE ROOM DIFFERENTIAL PRESSURE MONITOR/ALARM SHALL PRODUCE A LOCAL AUDIBLE ALARM. AN ALARM SHALL ALSO BE GENERATED AT THE BAS WORKSTATION(S).
 - ROOM PRESSURE SENSORS SHALL BE PROVIDED BETWEEN ISOLATION ROOM AND ADJACENT CORRIDOR AND THE ANTE ROOM AND THE ADJACENT CORRIDOR.
 - EACH ROOM SHALL HAVE ITS OWN MONITOR MOUNTED AS INDICATED ON PLANS. MONITOR SHALL HAVE A LCD DISPLAY WITH KEYPAD, ROOM ALARM STATUS INDICATOR, VISUAL AND AUDIBLE ALARM ANNUNCIATOR, ALARM RELAY OUTPUT, ANALOG PRESSURE OUTPUT (MA OR VDC TO BE MONITORED BY BAS), SERIAL ASYNCHRONOUS COMMUNICATIONS PORT UTILIZING ASCII OR BACNET MS/TP PROTOCOL, ALARM SILENCE VIA KEYPAD, TEST VIA KEYPAD, AND ISOLATED POWER SUPPLY. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 - SENSORS AND MONITOR SHALL HAVE DEMONSTRATED SUCCESSFUL OPERATION FOR A MINIMUM OF 3 YEARS IN ISOLATION ROOM MONITORING APPLICATIONS.
 - EACH MONITOR SHALL HAVE A KEYED OVERRIDE SWITCH THAT ALLOWS THE MONITOR TO BE TAKEN OUT OF SERVICE WHEN SPACES ARE NOT IN USE FOR ISOLATION. WHEN THE KEYED OVERRIDE SWITCH IS PLACED IN THE "NEUTRAL" POSITION THE ROOM MONITOR DISPLAY INDICATOR SHALL CHANGE FROM "NEGATIVE" TO "NEUTRAL". WHEN THE KEYED OVERRIDE SWITCH IS PLACED IN THE "NEGATIVE" POSITION THE ROOM MONITOR DISPLAY SHALL CHANGE FROM "NEUTRAL" TO "NEGATIVE". NO HVAC AIRFLOW CHANGES SHALL OCCUR, JUST DISABLING OF LOCAL AND REMOTE/BAS ALARMS BASED UPON VAMC PROTOCOL/AUTHORIZED PERSONNEL USAGE OF KEY SWITCH.
 - ROOM PRESSURE SENSOR AND MONITOR SHALL BE PROVIDED AS A PACKAGE FROM A SINGLE MANUFACTURER.

TYPICAL SURGICAL SUPPORT AREAS (PACU/PRE-OP/ADMIN)

NTS



- THE SUPPLY, RETURN AND/OR EXHAUST AIR TERMINAL UNITS (TUS, TUR, TUE) SHALL BE PRESSURE INDEPENDENT AND SHALL MODULATE TO MAINTAIN OCCUPIED OR UNOCCUPIED MODE AIR FLOW AT ALL TIMES DEPENDING UPON THE ENGAGED OPERATIONAL SEQUENCE FOR THE BLDG 1 SOUTH THIRD FLOOR SURGERY FACILITY SUPPORT AREAS (PACU/PRE-UP/OFFICE/ADMIN). DIFFERENTIALS BETWEEN THE SUPPLY, RETURN AND/OR EXHAUST (AS NOTED ON DWGS.) SHALL BE MAINTAINED TO INSURE PRESSURIZATION IN THE SPACES/OVERALL SURGICAL FACILITY AS REQUIRED.
- AIR QUANTITIES FOR ALL AIR TERMINAL UNITS SHALL BE FULLY ADJUSTABLE WITHIN THE BAS. SUPPLY, RETURN, EXHAUST AIRFLOW, ROOM TEMPERATURE AND ROOM OCCUPANCY (WHERE INDICATED ON PLANS) SHALL BE MEASURED, MONITORED AND ALARMED WITHIN THE BAS FOR EACH SPACE. TOTAL AHU SUPPLY, RETURN/RELIEF/EXHAUST AIR AND TOTAL OUTDOOR AIR SHALL ALL BE TRACKED AND TRENDED TO MAINTAIN THE PROPER SPACE BY SPACE OFFSETS AS WELL AS THE TOTAL BUILDING PRESSURIZATION OFFSET CFM AS MEASURED AND SET WITHIN BAS THROUGH COORDINATION WITH TAB CONTRACTOR. DESIGN INTENT IS FOR SURGICAL SUPPORT AREAS TO OPERATE SLIGHTLY POSITIVE WITH RESPECT TO EXTERIOR/OUTDOOR REFERENCE PRESSURE.
- NORMAL OCCUPIED AND UNOCCUPIED MODES MAINTAIN THE TYPICAL SURGICAL SUPPORT ROOMS AT AIRFLOW OFFSETS AND RELATIVE PRESSURES AS PER DWG. M7.00. TYPICAL SURGICAL SUPPORT ROOMS DO NOT INCLUDE ROOM PRESSURE MONITORING, HOWEVER, BAS CONTRACTOR SHALL ASSIST TAB CONTRACTOR IN THE VERIFICATION AND DOCUMENTATION OF EACH OPERATING MODE AND THAT TYPICAL ROOMS MAINTAIN DESIGN INTENT AIRFLOW OFFSETS AS SCHEDULED AND AS INDICATED ON DRAWING M7.00.
- SURGICAL SUPPORT AREA TEMPERATURE SENSORS SHALL PROVIDE REHEAT COIL CONTROL AS DESCRIBED IN AIRFLOW CONTROL VALVE SEQUENCES AS WELL AS FEEDBACK/ALARM OF SPACES THAT INCLUDE PERIMETER HEATING RADIANT CEILING PANELS.



- GENERAL: CONTROL VALVE FOR PERIMETER PACU/CONSULT ROOM RADIANT CEILING PANELS SHALL BE STROKED FULLY OPEN WHENEVER OUTDOOR AIR TEMPERATURE IS BELOW 60 DEG F (ADJ.). CLOSE VALVE UPON OA REACHING 65 DEG F (ADJ.).
- FAILURE MODE/FEEDBACK CONTROL: DESIGN INTENT IS FOR RADIANT CEILING PANELS TO ACT AS CONSTANT HEATING BASED ON OA AS PER ABOVE. ROOM REHEAT TO OPERATE AS DESCRIBED BY ROOM SEQUENCE. AS A FEEDBACK CONTROL/SAFETY, BAS SHALL MONITOR INDIVIDUAL SPACE TEMPERATURE SENSORS ASSOCIATED WITH EACH GROUPING OF RADIANT CEILING PANELS. BAS SHALL CLOSE THE RADIANT CEILING PANEL CONTROL VALVE IF AVERAGE SPACE TEMPERATURE MEASURED RISES 2 DEG F (ADJ.) ABOVE SPACE TEMP. SET POINT. CONTROL VALVE SHALL BE RE-OPENED AFTER A 30 MINUTE PERIOD (ADJ.) SHOULD OA TEMPERATURE MEET CRITERIA ABOVE AND AVERAGE SPACE TEMPERATURE FALLS 2 DEG F (ADJ.) BELOW SPACE TEMP.

PERIMETER CEILING RADIATION

NTS

MISC. MONITORING POINTS

NTS

- GENERAL
 - PROVIDE GENERAL MONITORING FOR SEQUENCES OF OPERATION AND/OR FAULT STATUS AND ALARM FOR THE FOLLOWING:
 - OUTDOOR AIR REFERENCE TEMPERATURE AND HUMIDITY
 - OUTDOOR REFERENCE PRESSURE (FOR PRESSURE OFFSETS/CASCADE INDICATED ON DRAWING M7.00).
 - TEMPORARY GAS STORAGE ROOM EXHAUST FAN, 15-EF-11, GENERAL FAULT STATUS.
 - EXISTING ISOLATION ROOM EXHAUST FAN, 15-EF-16, GENERAL FAULT STATUS.
 - ATS/EMERGENCY GEN STATUS FOR EMERG POWER STATUS.
 - FAULT/STATUS FOR THE EXISTING BUILDING IS HEATING HOT WATER SYSTEM (DISTRIB. PUMP FAILURE/HWS TEMPERATURE).
 - FAULT/STATUS FOR THE EXISTING CHILLED WATER SYSTEM (DISTRIBUTION PUMP FAILURE/HWS TEMPERATURE).
 - FAULT-ON-OFF STATUS OF 15-AH-16 ROOFTOP CHILLED WATER PIPING ELECTRIC HEAT TRACE.
 - FAULT-ON-OFF STATUS OF PEM UTILITY RISER PIPING (WAKE-UP WATER, FLOOR DRAINS, CHILLED WATER) ELECTRIC HEAT TRACE - PIPING THROUGH RAISED EQUIPMENT CURB.
 - FSD - SD DAMPER END SWITCHES (OPEN/CLOSED STATUS).
 - FSD - SD SMOKE DETECTOR STATUS
- NOTE: SEE POINTS LISTS ON CONTROLS DRAWINGS, PLANS, AIRFLOW DIAGRAMS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS. PROVIDE ANY ADDITIONAL POINTS REQUIRED FOR SEQUENCES OF OPERATION.

100% CONSTRUCTION DOCUMENTS FULLY SPRINKLERED

CONSULTANTS:			ARCHITECT / ENGINEERS:			Drawing Title MECHANICAL CONTROLS			Project Title RENOVATE SURGICAL SERVICE & UPGRADE OPERATING ROOMS			Office of Construction and Facilities Management		
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